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Price Standardization a Public Service

American Fair Trade League Favors National Legislation to Restore What it Regards as Right of Owner of a Brand to Establish Standard Resale Prices—Action is Designed as a Public Service—Effect of Price Cutting on Smaller Independent Merchants—Bills Now in Congress

By *Edmond A. Whittier.**

THE present session of Congress can accomplish few things more important to the consuming public than restoring to producers of branded goods the right to establish standard resale prices, of which they were deprived in 1912 by a "five to four" decision of the United States Supreme Court in what is known as the Dr. Miles Case. This right had never previously been questioned anywhere. It is lawfully exercised today in every other civilized country on earth.

During the ten years' struggle for corrective legislation to prevent misuse of trade mark good will as deceptive "bargain bait" a succession of Supreme Court decisions have left the situation, if anything, more involved than it was when the fight started. Legislative progress was impossible during the war and post war period of inflation; but within the past year sentiment has rapidly crystallized and the advocates of the Kelly-Stephens and the Merritt Bills have made a decided advance. This reform, like all worth-while and fundamental reforms, has necessitated a long process of education. But now the issue is clearly defined; the price standardization bills were reintroduced on the first day of the new Congress session and the way seems clear toward final legislative action.

One reason for my confidence in these measures—both seek the same end—is the increasing realization in Washington that their enactment will be a great public service. We hear much talk about "the interests," meaning private or special interests. It is true that every new law is promoted by some interest, or group of interests, but the advocates who can prove that their aims are closely identified with the interests of the public are the ones most likely to succeed.

Resale Prices and Public

The resale price contest has reached the point where the deciding factor is not the interest of the manufacturer, nor the interest of the distributor. The question as it stands is simply this: Will the general public—which is to say the buying public—benefit if manufacturers are able to standardize the retail price of their own brands of goods?

The American Fair Trade League has always been satisfied to have it fought out on this basis. One of the obstacles the league has had to overcome is the impression, fostered by the opponents of price standardization, that the proposed legislation would be for the benefit of a few large manufacturers and would enable them to establish a monopoly on more or less essential products. The history of the Price Standardization movement shows that this conception is erroneous. In fact the Fair Trade League was organized as the result of a realization that this question should be discussed, not on the basis of its relative importance to manufacturers and distributors, but as a matter of public policy.

The American Fair Trade League was established for the mutual interest of the consumer, the middleman and the manufacturer. Its first aim is to promote honesty in business. Through legislation and through public opinion it is working against unfair competition, dishonest advertising and the elimination of the smaller business man by unfair methods. Mr. Whittier, the writer of this article, was one of the organizers of the League and has been its chief executive officer since the establishment of the organization ten years ago.

The organization of the League in 1913 was due mainly to a suggestion of the Hon. Louis D. Brandeis, now Justice of Supreme Court. A short time before, Mr. Brandeis had appeared before the House Committee on Patents as counsel for a manufacturer who was interested in a bill introduced by Representative Oldfield, of Arkansas, for the purpose of restricting the rights of patentees. The writer, who was then in the advertising business, was in Washington at the same time attending hearings on the Oldfield Bill as an observer for some of his clients. The doctrine upon which the present Kelly-Stephens Bill is founded was first enunciated by Mr. Brandeis in a conference of manufacturers who were in Washington on the same errand.

"You gentlemen are barking up the wrong tree," said Mr. Brandeis. "You are wasting your time defending the rights of the patentee. You should put this matter on a much broader basis. The common law gives the manufacturer the right to protect his good-will and the integrity of the article he makes. The thing to do is to draft a bill founded on the common law and to present it as a matter of public policy."

The first Price Standardization Bill was drawn up that year in the form approved by Mr. Brandeis and introduced in the Fifty-Third Congress by Representative Raymond B. Stevens of New Hampshire. When Representative Stevens left the House of Representatives, the measure was sponsored by Representative Daniel V. Stephens of Nebraska, and later by Representative Clyde Kelly of Pennsylvania. Subsequently Representative Schuyler Merritt of Connecticut introduced a similar bill.

Demand for Legislation

During the war and immediately after no attempt was made to push these measures but, with the settlement of business conditions, has come again the insistent demand for legislation that will put an end to ruinous competition and price-cutting which deprives manufacturers of branded goods of their just rewards.

As the federal law now stands, the situation is intolerable. No manufacturer knows what his legal rights are. The United States Supreme Court has told him he may refuse to sell to those who cut his price but has denied him every practicable means of exercising the right.

The members of the American Fair Trade League have presented this question to the National Legislature as a matter of general economic welfare. It does little good to present an impressive list of commercial organizations behind a measure unless it can be shown that they are acting in the public interest. Senators and Representatives cannot be expected to look at this bill through the manufacturer's eyes. Its opponents have attempted to befog the issue by raising the cry of monopoly. They have tried to prove that uniform resale prices will lead the manufacturer to exhorbitant profits and that the ultimate consumer will suffer accordingly. It is needless to discuss the fallacy of this argument in a publication such as this. What I wish to emphasize is the fact that manufacturers must look at this matter from the public viewpoint; they must teach those who buy their products for personal use to understand the true purpose of "cut-price" sales. The consumer does not analyze these questions. We cannot expect him to. There is a tremendous opportunity here for manufacturers of branded merchandise, who have built up their reputations by years of honest work, to make the consumer understand why it is to his advantage to be able to buy a branded article

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at the same price regardless of where it is sold.

Education Through Advertising

These manufacturers include some of the largest advertisers in the country. It is advertising, next to the merits of their goods, that has given most of them the leadership they rightly enjoy. Why should they not devote some of their advertising efforts to educational standard price campaigns? Here are a few of the facts they can teach the public—facts which the public will understand and appreciate:

That during the abnormal price advances after the war articles upon which uniform resale prices were maintained showed a far smaller ratio of price increase than the general average.

That retailers who attract trade by cutting prices of standard goods more than make up their losses by exhorbitant profits on unknown goods of doubtful quality.

That price-cutting tends to ruin the business of independent merchants and concentrate trade in the hands of a few middle-men.

That refusal to a manufacturer of the right to standardize resale prices deprives him of the just return for his industry, enterprise and honest dealing with the public and robs him of the good-will which may be his greatest asset.

Each manufacturer whose prosperity is founded upon a determination to give the consumer the very best that can be produced for the money has an individual problem. Educating the general public on the lines suggested is a big contract which no one manufacturer cares to tackle alone. But through the great trade associations of the country and through organizations like the American Fair Trade League, which include representatives of various producing and distributing agencies, through teachers of domestic economy and through the multitudinous channels that reach the intelligence of the American people, this work is being carried on.

There is no sounder American doctrine than the one which allows a citizen, or group of citizens, to reap the rewards of ingenuity and industry, so long as ingenuity and industry are in line with the public good. This whole question of price standardization has become involved in legal and commercial technicalities, which, interesting as they may be to the lawyer and the business expert, mean nothing to the great army of retail buyers. But when you talk to the consumer in terms of fair play you use a universal language. Fair play is the very foundation principle of the Kelly-Stephens and the Merritt Bills. That is why I never have lost faith in ultimate success.

Millinery Hearing Postponed

WASHINGTON, D. C.—The Tariff Commission's hearing on millinery, scheduled for Jan. 22 has been postponed until March 26.

Branding and Labeling Bills

Advocates of "Truth-in-Fabric" Bill Shift to Practical Honest Merchandise Act

By *Lincoln Cromwell* *

MR. LLOYD GEORGE, in his Metropolitan Opera House speech told of a road sign near Washington which amused him greatly. It read, "This Road is Not Fool Proof." He wished that every law and every treaty, could be labeled "This is not fool-proof." We may echo his words.

Last year I reported to you about two labeling bills then and now before Congress. The French-Capper Truth-in-Fabric Bill would compel the marking on every fabric or garment containing wool the percentage of pure or "virgin" wool, the percentage of re-worked wool or "shoddy," and the percentages of every other fibre in the cloth. The sponsors of this bill admit that there is no test which can distinguish reworked from new wool in yarns or cloths, that it would take five years to install marking machinery to carry out this law, that an army of government inspectors would have to live in the woolen mills and the clothing factories, and that the main purpose of the bill is to prevent the use of re-worked wool and thereby raise the price of new wool.

A Deceptive Bill

It is putting it too mildly to say that this so-called "Truth-in-Fabric" bill is not fool proof. It would fool the consumer about intrinsic service qualities of clothing worse than the shabbiest frauds ever practiced. It is a plain invitation to the woolen textile industry and trade to adopt the hypocrisy, the lying, and the contempt of law which the Volstead act has established in regard to liquor. It imposes a difficult, expensive, and often destructive marking on both domestic and imported goods containing wool, and instructs the Secretary of the Treasury to destroy imported yarn, fabrics, and garments refused entry under this bill.

The most charitable thing to be said for it is that this proposed legislation comes from a strictly agricultural state where the practical problems of the manufacturer are not understood.

Fortunately, the main support of this Truth-in-Fabric bill has now deserted it. The National Sheep & Wool Bureau voted unanimously on Dec. 9 to abandon the French-Capper bill and to support instead the Honest Merchandise Act introduced by Senator Lodge. This bill has been amended by making it fraudulent to label anything "pure wool" or "virgin wool" which contains any reworked wool, cotton, or fibre other than new wool. This amendment satisfies the Wool and Sheep Bureau which originated the Truth-in-Fabric bill. It should satisfy every honest manufacturer and merchant, for it is strictly in line with all the other prohibitions of deceptive merchandising made criminal under the bills introduced by Senator Lodge and Representative Rogers.

Honest Merchandise Act

Now that the National Sheep & Wool Bureau has come over to the Honest Merchandise Act, its passage should be easy at this session of Congress. We need it in our business. It is the simplest law you ever read. It says that any person who misbrands or misrepresents any article or who sells or ships any article to which a false description is applied, or advertises it falsely, shall be guilty of a misdemeanor, and be fined or imprisoned. It provides that an article shall be deemed misbranded or misrepresented:

> "First. If it be offered for sale under the name of another article or with a name or brand so nearly like it as to deceive purchasers as to its origin or character.
>
> Second. If the contents of the package, as originally put up, shall have been removed, in whole or in part, and other contents shall have been placed therein unless a conspicuous notice of such change of contents is attached to such package.
>
> Third. If in package form, and the contents are stated in terms of weight, measure, numerical count, or quality, they are not plainly and correctly stated on the outside of the package, or are stated in such manner as to deceive or mislead the purchaser or be designed or calculated so to deceive or mislead such purchaser."

All of this is practically the British Merchandise Marks Act written so plainly that it has effectively controlled fraud in England for thirty years and hardly a case has had to be tried under it. The Lodge bill is a prohibition law which prohibits. It imposes no new expense on us or the government. It does not require you to label the percentage of wool or anything else. Its definitions of honesty are as old as civilization. Diogenes, looking for his honest man in Athens, would have made it his code. It has no jokers protecting any class or interest in any way except against the plainly dishonest competitor.

The Federal Trade Commission has done a great service by calling attention to trade deceptions, some thoughtless, some wilful. But the Federal Trade Commission has power only to stop such wrongs. Under the Honest Merchandise Act they will be punished as criminal.

My excuse for taking your time this morning is to report the significant shift in support away from the French-Capper compulsory labeling bills, and over to the Honest Merchandise Act instead. But the latter is not yet law. Your endorsement last year of this measure should be renewed and every aid given to secure its passage by Congress. This association cannot do a better service to its members and to the business standards of the country.

* William Iselin & Co. Speech delivered Jan. 17 at convention of National Wholesale Dry Goods Association in New York.

Interpret Daugherty Report

Association Collection of Statistics May Not Violate Laws

Washington, D. C.—Mere collection by a trade association and distribution among its members of current statistical trade information, in which the individual manufacturer's items of production, shipments, stocks, and prices on closed transactions are used in tabulating averages but remain unidentified, do not constitute violation of the anti-trust laws, according to authoritative opinion expressed subsequent to publication of the new Hoover-Daugherty correspondence.

To the Department of Justice is conceded the right to pursue whatever policy it sees fit and in his letter to Secretary Hoover Attorney General Daugherty stated that the court's decree forbidding the Tile Manufacturers' Credit Association to collect trade statistics for any other purpose than to furnish them to the Commerce Department for public distribution is an application of the policy of the Department of Justice.

Giving full weight to the Attorney General's statement, it is submitted that no court will uphold his department on the showing merely that a trade association collects and distributes to its membership statistics that do not reveal the operations of any one particular member.

The Supreme Court's opinion in the hardwood case is not so broad in its terms as the Department of Justice is in its application, it is stated. The condemnation of the Supreme Court did not fall upon collection and dissemination of statistical trade information but upon the practice of the hardwood association in using these figures to control production and prices, and such use of these statistics must be proved in any case prosecuted by the Department of Justice, it is maintained.

Under the co-operative plan now in effect the Commerce Department receives from many associations the statistical information furnished to their members, which is made public by the Department. It is expected that Secretary Hoover will continue this plan in operation, on the assumption that the burden of proof that unlawful use is made of the statistics by association members acting in concert still rests on the Department of Justice. It remains to be seen whether the trade associations that have co-operated with Secretary Hoover in the past will support or can afford to support him.

Editors
Charles H. Clark Vernon E. Carroll
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EDITORIAL

We Believe
in the Conservation and Protection
of Domestic Industries

Who Will "Hold the Bag?"

FAILURE of wool importers to back up their bullish forecasts of the world wool situation and prices by large scale operations in primary markets appears to puzzle many manufacturers, and causes some of the latter and many clothiers and jobbers to doubt the complete honesty of these forecasts despite the well-authenticated decrease in world supply and the recent marked advance of prices in foreign primary and secondary markets.

Importers freely acknowledge that they have been comparatively small operators in foreign primary markets thus far, and particularly in South America where the season is nearly over and American purchases have been infinitesimal as compared with those of a year ago. In fact, the consensus of opinion is that American purchases in foreign primary markets thus far have not been in excess of 50,000,000 pounds, as compared with at least three times that amount at this period of last season. Nevertheless, we believe it can be demonstrated that there is nothing inconsistent in the failure of importers to back up their bullish opinions with large purchases, although it may not represent farsighted merchandising.

Three factors appear to be chiefly responsible for the hands-off policy of most importers in foreign primary markets: One is the fact that importers' stocks, although much smaller than those of a year ago, in clean pounds, are nearly as large in value, with the prospect that much more money than last season will be required to finance the purchase of the new domestic clip; second, on account of unseasonable weather there is increasing price resistance all the way from the retailer back to the wool dealer, combined with an effort to oblige the seller to anticipate the buyer's future needs in wool, cloths and clothing; last, but not least, is the recollection by wool dealers of their experience during two price advances that have occurred since the close of the World War, on both of which occasions, for their attempts to anticipate manufacturers' needs, they received nothing but thanks from the mill men, together with large financial losses when the latter's needs failed to materialize as expected.

Reasoning from these premises, dealers, and particularly importers, have come to the logical conclusion that the chances of large speculative gain are too small to warrant them in being the sole holders of the bag for manufacturers, middlemen and retailers. Their attitude has already forced some of the largest top makers and spinners to purchase wool rather liberally in foreign primary markets, and the logical sequence of this policy will be to distribute the season's financial and speculative burden all along the line from dealers to retailers. With every important factor having a hand on the bag and assuming a fair share of responsibility while the present market uncertainty lasts, the chances of large losses and large profits will be eliminated, and general confidence in the strength of the world wool situation, and of a normal distribution of wool manufactures, should the sooner reassert itself.

* * *

Curtailment a Remedy

PERHAPS one of the most hopeful signs of returning health and prosperity in the textile industry is the amount of curtailment in progress at the present time. This is particularly true of New England, where textile plants are being generally run on an abbreviated schedule. In fact, the amount of shutdown that is reported from that section is probably greater than for the last year or more. But this is not the only section where mills are shutting down, for reports from the South indicate that plants which ran double shift at times last year are now being operated very indifferently at varying hours per week.

The reason why such procedure is in evidence today is that manufacturers are not confronted with the financial problems that were in evidence a few years ago, when, no matter what the demand, mills were run particularly in the South, at full tilt. It was necessary in those days to keep going in order to get advances on merchandise from fiscal agents. It was also desirable, if not imperative, to prevent the disintegration of labor organizations. Today both of these factors are comparatively negligible. Manufacturers are increasingly sufficient unto themselves, as far as their financial arrangements are concerned, and there is not the competition between them for each other's help. The various forms of activity involving the participation of the operative, have minimized the migratory element among operatives so that the fear of disorganization is not present to cause unhealthy operation of textile plants.

If there is one thing more than another that can be pointed to in the present situation as a tendency toward general prosperity, it is the absence of stocks. This condition obtains in all branches of the industry, from the manufacturer to the retailer. It is a commentary on the conservatism of manufacturers and of buyers that in spite of the high prices they have been able to obtain for their merchandise, they have not loaded up with goods upon which possible depreciation might be witnessed. Of course, it may be argued that in all quarters of the market sellers as well as buyers were forced to this conservatism by reason of the high prices they have been compelled to pay and the consequent lessening of profit margins obtainable. Nevertheless, whatever may be said in this connection, the fact remains that conditions have led to a healthy statistical situation, while the current procedure in the manufacturing end tends to confirm and strengthen this healthy status.

Disappointment has been expressed in certain quarters that buying has not started as favorably as many had hoped would be the case with the advent of the new year. It is a market based on skepticism of the present prices of raw material and the ability of the consumer to absorb merchandise at existing levels. If, with the continuance of steady employment, the volume of curtailment shall be of wide extent, there is nothing to fear respecting the future, which is to all appearances likely to be fruitful of satisfactory results to the manufacturer who keeps his feet on the ground and does not allow himself to be carried away by groundless rumors and pessimistic apprehensions.

* * *

Senator Copeland Peeved

SENATOR COPELAND is continuing his reputation as a successful seeker of publicity. This reputation was pretty firmly established when he was Health Commissioner of New York City and has not been endangered since he shook off the dust of the metropolis for more dignified duties in the national capitol. Returning to his native heath upon invitation of the Silk Association recently, he ventured to expound his theory of combined legislation on tax reduction and a bonus payment. The reception which this pronouncement encountered at the silk dinner has evidently offended the dignified Senator and inasmuch as he secured little publicity from the speech itself, he has evidently determined to make up for it by interviews with representatives of the daily press and even by means of the radio. He is violent in his denunciation of the reception accorded him, declaring the outbreak at the dinner to be "a violent attack of mass hysteria." His medical experience is recalled in the statement that he "never more enjoyed a clinic in mental nervous diseases."

It is not surprising that business men should express their feelings at the veritable nonsense contained in Senator Copeland's speech at the dinner mentioned above. There is an old adage that one cannot eat his cake and have it too, which probably was in the minds of his hearers when the Senator tried to argue in favor of a tax reduction combined with the payment of a bonus. The combination does not mix and it certainly did not appeal to the common sense of hard-headed business men, even at a function where statements are not always taken at their face value.

It is just possible that the "mass hysteria" of which Senator Copeland so ironically complains, may exert itself in a broader sense than was possible in connection with an after dinner speech. We do not know whether Senator Copeland intends to enter the arena for re-election, but if he does, it would not be without the realms of possibility that he may encounter some symptoms of this "mass

hysteria" that would have a very disastrous effect upon the chances of his future residence in Washington.

* * *

Filming Textile Processes

WE have several times alluded to the benefits that accrue from actual observation of what is taking place with the textile materials in process of manufacture, and facts which were formerly matters of opinion or conjecture are now capable of visible demonstration by means of the slow-motion magnifying camera.

Several mills have employed this device for the education of their own help in proper methods of doing such work, showing the right way and the wrong way. Sometime ago, we described what the Fairhaven Mills had been doing in this direction. Research investigators also employ this method with marked success.

The eye is a better teacher than the tongue. In New England mills where a dozen different languages may be spoken under the same roof, with no one person capable of speaking to everyone in the mill in his own language, it would seem as if the method of instruction through the camera could be developed to far greater extent than has been done up to the present time. New England's prosperity in textile lines is so largely dependent upon utilization of every possible means of accomplishing the most perfect work at the lowest labor cost, that there would appear to be a field for development in this direction which had not been fully utilized.

A good example of this type of motion picture is the film "Thirsty Cotton" which has been exhibited during the last two years before 296 different audiences with a total attendance of 17,579, ninety per cent of whom were in one way or another connected with textile mills. These mill people who saw this film certainly have a better idea of what actually takes place in the spinning of cotton under dry and under properly humidified conditions. There are great possibilities of extending this idea in the education of mill operatives either under the auspices of the manufacturers' associations or by the larger mills for their own benefit.

Fewer Blanket Sizes

Committee on Simplification Recommends Minimum Number

The following invitation has been sent to members of the textile industry by R. M. Hudson of the Simplification Division of the Department of Commerce:

"The Committee on Simplification of Bed Blanket Sizes has completed its survey of existing diversity in sizes and dimensions of these commodities, and now requests us to call a general conference of all interests to review its findings.

"It is expected this discussion will result in adopting a simplified line of sizes offering greater convenience and saving to all concerned than is possible with the present wide variety. The committee submits the inclosed tentative recommendations as the basis of 'Simplified Practice Recommendations' which the Department of Commerce can indorse and support by publishing them in its 'Elimination of Waste' series.

"The results of similar action in reducing waste in the manufacture and sale of beds, springs and mattresses, lumber, woven-wire fence, and several other commodities, assures the committee that the blanket industry will be greatly benefitted by this simplification.

"The conference will be held Friday, Feb. 1, 1924, at 10:30 a. m., in room 704, Commerce Building, 19th and Pennsylvania avenue, Northwest, Washington, D. C.

"May we have the pleasure of your attendance or representation at this conference?"

Report of Committee

The agenda for the February meeting is as follows: The committee appointed Feb. 1, 1923, at the preliminary conference of manufacturers, distributors, and consumers of bed blankets with the Department of Commerce to survey current variety in sizes and dimensions of these commodities now submits the following data as basis of its 'Simplified Practice Recommendations.'

Twenty-three (23) sizes were manufactured by the producers of wool, and wool mixed, blankets in 1920, 1921 and 1922. 75.62 per cent of their entire production covered these four sizes:

60x80-inch — 7.06 per cent.
66x80-inch — 32 90 per cent.
70x80-inch — 25.95 per cent.
70x80-inch — 9.71 per cent.

Less than 2 per cent was spread over 14 other sizes.

Twenty (20) sizes were manufactured by the producers of cotton blankets in the same period. 80.12 per cent of their production covered these seven sizes:

60x76-inch — 6.64 per cent.
64x76-inch — 16.61 per cent.
66x80-inch — 26.67 per cent.
68x80-inch — 66.30 per cent.
70x80-inch — 8.57 per cent.
72x80-inch — 9.60 per cent.
72x84-inch — 5.73 per cent.

Combining the sizes of the two groups, approximately 82 per cent of the woolen manufacturers' production, and 80 per cent of that of the cotton manufacturers can be taken care of with nine sizes:

60x76-inch	66x80-inch	72x80-inch
64x76-inch	68x80-inch	70x82-inch
60x80-inch	70x80-inch	72x84-inch

In view of the facts brought to light by this survey—the committee feels warranted in recommending the adoption of a consistent minimum line of sizes as the basis of future production and sale of blankets. It is the purpose of this conference to determine and agree upon those sizes which shall constitute that simplified line.

All of the members of the following committee, it is stated, support this recommendation:

Chairman, J. J. Pearce, Pearce Mfg. Co., Latrobe, Pa.; John Cutter, Armory, Browne & Co., Boston; National Association of Cotton Manufacturers; R. R. Kohr, Susquehanna Woolen Co., New Cumberland, Pa.; American Assn. of Wool Blanket Mfrs.; Chas. V. Ryer, Jr., Amory, Browne & Co., New York; Association of Cotton Textile Merchants of New York; Albert D. Farwell, John V. Farwell Co., New York; National Wholesale Dry Goods Association; Norman H. Johnston, secretary, Southern Wholesale Dry Goods Association, Richmond, Va.; Wm. A. Stiles, Strawbridge-Clothier Co., Philadelphia; National Retail Dry Goods Association; L. A. Hansen, secretary, Massachusetts Retail Merchants Association, Boston; W. I. Hamilton, director of the American Hotel Association Research Bureau; Miss Doris Schumaker, Cornell University, Ithaca, N. Y.; American Home Economics Association.

Textile Merchants Elect

At the annual meeting of the Association of Cotton Textile Merchants of New York held recently the following officers were elected: President, Richard E. Reeves of Hunter Mfg. & Com. Co.; vice-president, John E. Rousmaniere of Lawrence & Co.; treasurer, Elliott M. Eldredge of Eldredge & Snyder; secretary, P. S. Newell. The following were elected directors for three years: John W. Bird, Amory, Browne & Co.; Howard S. Borden, M. C. D. Borden & Sons, Inc.; William D. Judson, Parker, Wilder & Co., and John E. Rousmaniere. Oliver Iselin of Wm. Iselin & Co., was elected a director to serve until 1925, filling the unexpired term of the late John C. Leslie. In addition to the above the following are members of the board: Cornelius N. Bliss, of Bliss, Fabyan & Co.; Samuel M. Copeland, of Converse, Stanton & Co.; Lincoln Grant, of Wellington, Sears & Co.; Thomas W. Slocum, of Minot, Hooper & Co., and C. Morton Whitman, of Clarence Whitman & Co.

TEXTILE CALENDAR

Manufacturers' Textile Association, Annual Meeting, Bancroft Hotel, Worcester, Mass., February, 1924 (Exact date to be announced later).

Boston Wool Trade Association, Annual Dinner, Copley-Plaza Hotel, Boston, Mass., February 28, 1924.

Committee D-13 on Textile Materials, American Society for Testing Materials, Spring Meeting at U. S. Bureau of Standards, Washington, D. C. March 7-8, 1924.

Knitting Arts Exhibition, Commercial Museum, Philadelphia, April 7-11, 1924.

National Association of Hosiery and Underwear Manufacturers, Annual Convention, Bellevue-Stratford, Philadelphia, April 8-9, 1924.

National Association of Worsted and Woolen Spinners, Annual Meeting, May 14, 1924 (Place to be decided later).

Associated Knit Underwear Manufacturers of America, Annual Meeting at Atlantic City, N. J., May, 1924 (Exact date to be announced later).

American Cotton Manufacturers' Association, Annual Convention, Hotel Traymore, Atlantic City, N. J., May 27-28, 1924.

Cotton Manufacturers' Association of North Carolina, Annual Meeting, Blowing Rock, N. C., latter part of June, 1924.

Southern Textile Exposition, Textile Hall, Greenville, S. C., Oct. 20-25, 1924.

Textile Club Sees "Movies"

Unique Entertainment at Southern New England's Meeting

The 107th meeting and dinner of the Southern New England Textile Club was held at the Providence-Biltmore Hotel, Providence, last Saturday afternoon, at two o'clock. President Ezra Dixon presided and stated that the attendance was one of the largest of any meeting ever held in Providence. He welcomed the members of the association and the guests and thanked all who had anything to do with the success of the meeting. He welcomed particularly Secretary Harry C. Meserve of the National Association of Cotton Manufacturers, Albert Greene Duncan, former president of that association, whom he congratulated on his recovery from illness, and Nelson A. Batchelder, former president of the club, now located in Welland, Ontario.

The "Overseas" double male quartet rendered many enjoyable selections accompanied by Natzy's Biltmore orchestra. After a very good dinner, President Dixon turned the meeting over to Secretary W. S. Pepperell, who had arranged for the entertainment, which consisted of the following program of unique, interesting and educational moving pictures of industrial subjects: (1) Amoskeag Manufacturing Co., a film story of their business; (2) The Outlaw, the Career of King Carelessness, by the Liberty Mutual Insurance Co.; (3) Thirsty Cotton, by Parks-Cramer Co.

Meeting of Cotton Finishers

The Associated Textile Executives, which was recently organized and confines its membership to executives and managers of cotton finishing plants, held its fourth regular luncheon and meeting at the Biltmore Hotel, Providence, R. I., the afternoon of Jan. 12. Following the meeting that was presided over by Pres. John F. Bannon, of the Defiance Bleachery, Barrowsville, Mass., the members visited the new Jesse Metcalf chemical laboratory at Brown University. The next meeting will be held in April in Fall River, where the members will have the privilege of visiting one of the largest mills.

Greenville Mill Men Dine

L. P. Hollis Tells of Plan for Teaching Textile Processes

GREENVLLE, S. C.—The Cotton Mill Superintendents' Council of Greenville was host tonight at an elaborate dinner given in honor of cotton mill superintendents from mills in Anderson county. The dinner was attended by almost every mill superintendent in Greenville and Anderson. The evening was given over to pleasure. Children from the Parker School District, in which most of the Greenville mills are located, acted as entertainers during the dinner.

E. P. Gaines, professor of English at Furman University, delivered a short inspirational address after the dinner. L. P. Hollis of Greenville, superintendent of Parker School District and well known among southern mill men, presented during the evening the plan to induce the South Carolina legislature to provide funds for teaching textile processes in a practical way at a school or schools to be established in this State. Mr. Hollis said that the proposed schools would not conflict in any way with existing textile schools, but would be designed primarily to afford young people who are already in cotton mill work opportunity to improve their knowledge of various processes, particularly those concerned with fine goods and novelties. Mr. Hollis asked the support of the superintendents for the projected school and their influence in inducing the legislature to make the necessary appropriation.

M. O. Alexander, president of the Greenville Superintendents' Council and superintendent of the Woodside Cotton Mills, warmly welcomed the guests. Brief talks were also made by J. D. Beacham, M. T. Grimes, and others during the evening. The Anderson mill superintendents entertained the Greenville superintendents some time ago.

Willis H. Taylor, superintendent of the No. 3 mill of Republic Cotton Mills, Great Falls, S. C., was a guest at the dinner. Guests from Anderson, S. C., included: F. J. Clark, Anderson Cotton Mills; E. P. Cofield, Brogon Mills; H. P. Hunter, Equinox Mill; M. T. Grimes, Gluck Mill; J. A. Lyon, Orr Cotton Mills; Major J. T. Crawford, Riverside Mfg. Co., and Toxaway Mills.

Guests from other mills in Anderson county were: C. H. Strickland, Belton (S. C.) Mills; J. J. Jordan, Jackson Mills, Iva, S. C.; J. D. Beacham and G. H. Lollis, Chiquola Mfg. Co., Honea Path, S. C.; J. W. Kelly, Pelzer (S. C.) plant, New England Southern Mills; S. T. Buchanan, Piedmont (S. C.) Mfg. Co.

WATERFORD, N. Y. The Waterford Knitting Co. has resumed operations following a curtailment of several weeks.

Smaller Cotton Exports

Japan and Italy Only Two Countries Increasing Takings of American Cotton Since War

WASHINGTON, D. C.

NOT only have the total cotton exports from this country declined materially as compared with pre-war exports, but imports into the chief consuming region of northwest Europe are significantly lower, according to the study made by the Department of Commerce at the request of the last Congress of foreign markets for domestic farm products. Since the war northwest Europe has secured a smaller proportion of its supply from the United States than formerly. To only two countries—Japan and Italy—are exports of cotton from the United States greater than before the war.

The Commerce Department's report, insofar as it relates to cotton is presented herewith:

Imports of Cotton into Northwest Europe

Countries.	Pre-war average, 1910–1914.			Postwar average, 1920–1922.		
	From all countries.	From the United States.		From all countries	From the United States.	
		Quantity.	Per cent of total.		Quantity.	Per cent of total.
	Thousands of bales.	*Thousands of bales.*		*Thousands of bales.*	*Thousands of bales.*	
United Kingdom	4,748	3,574	75.3	3,145	2,169	68.9
France	1,435	1,120	78.1	1,091	794	74.2
Netherlands	265	42	15.8	115	78	67.6
Belgium	496	162	32.6	467	485	39.6
Germany	2,258	1,722	76.3	[1] 1,003	[1] 755	75.3
Total	9,201	6,620	71.9	5,821	3,981	68.4

[1] Two years only — 1920 and 1922.

Comparative Exports

Before the war exports of cotton amounted to an average of $552,000,000, or 54% of all agricultural exports from the United States. During the years since the war it has retained first place among these exports, but not so preeminently, accounting for but 32% ($781,000,000) of the agricultural exports from the United States.

Europe received before the war 94%, according to value, and northwest Europe alone took 83% of all cotton exported from the United States. The market next in importance, in quantity as well as value, was Asia, with Japan taking most of these exports. North America, with Canada as the chief buyer, came third.

During 1920–1922, 84%, in value, of all cotton exports went to Europe, with northwest Europe accounting for 67% of the total. Asia and North America follow in this order, but to Japan the quantity exported has more than doubled. The amount of cotton exported from the United States declined steadily from 1914 to 1918. The cotton crop for 1914 was 16,000,000 bales, the largest ever harvested, but since that year production has declined. In 1921 the crop was less than 8,000,000 bales, and in 1922 and 1923 only 10,000,00 bales were produced. During the war years a large proportion of the raw cotton produced in the United States was consumed in domestic mills, and a smaller proportion exported than under normal conditions. These two facts explain the sharp decrease in exports.

With the establishment of peace, an increased portion of the crop again began to be exported. This movement appears in the rising total of exports in 1919. However, exports have not reached the pre-war level, but have flattened out almost horizontally, with even a slight downward trend since the war. The post-war average production is less than that for the pre-war period by about 1,500,000,000 pounds, while the average for exports has dropped approximately from 4,500,000,000 to 3,250,000,000 pounds. Economic depression in Europe has diminished the demand for raw cotton at the same time that the boll weevil diminished the supply in this country. It remains to be seen whether either production or exports of raw cotton will again reach the pre-war level.

To two countries only, Japan and Italy, do the post-war exports exceed those for pre-war years. Japan has more than doubled the amount of raw cotton imported from the United States, and today it is an important market, as the Japanese textile industry is developing rapidly.

Exports to Northwest Europe

Before the war the United Kingdom, Germany and France, in the order named, were the chief importers of cotton from the United States. To the two former countries present exports are about two-thirds of those before the war, and to Germany approximately only one-half. Together the five countries of northwest Europe received approximately 75% of all cotton exported from the United States. Today they take something more than 60 per cent on account of the increased proportion for Japan and Italy.

The significance of cotton exports from the United States may be viewed from another aspect, namely, the relation of imports from the United States to imports from all countries, as shown by foreign statistics. As has been indicated, northwest Europe is the world's chief consumer of raw cotton. The average pre-war imports into this region from all countries were 9,201,000 bales; of this quantity 6,620,000 bales (72%) came from the United States. For the years 1920–1922, 5,821,000 bales was the average imported from all countries, with 3,981,000 (68%) coming from the United States.

The United Kingdom reported 4,748,000 bales as its pre-war yearly import from all countries, and 3,574,000 bales, or 75%, from the United States. After the war its total average imports were 3,145,000 bales, and those from the United States were 2,169,000 bales, or about 70% of the total. For Germany the total pre-war imports were 2,258,000 bales, with 76 per cent coming from the United States, while its imports from all countries after the war were only 1,000,000 bales, with 75% coming from the United States. France imported before the war nearly 1,500,000 bales of cotton and secured 78% from the United States while after the war its total imports were a little more than 1,000,000 bales, of which 74% originated in the United States.

To summarize briefly, not only have the total cotton exports from this country declined materially as compared with pre-war exports, but imports into the chief consuming region of northwest Europe are significantly lower. During the post-war years northwest Europe has secured a smaller proportion of its supply from the United States than formerly. The only two countries Japan and Italy, are exports of cotton from the United States greater than before the war.

Havre Cotton Stocks

WASHINGTON, D. C.—Raw cotton warehoused at Havre on Jan. 3, amounted to 129,000 bales, including 123,000 bales American, according to cable advices to the Department of Commerce, from Commercial Attache Jones, at Paris. Stocks afloat for this port totaled 69,000 bales, all of which were American. These stocks are somewhat larger than on Nov. 30, when 121,000 were reported at Havre and 52,000 bales afloat. Cotton spinning and weaving are calm.

Spanish Cotton Stocks

WASHINGTON, D. C.—The Barcelona cotton exchange reports Spanish imports of raw cotton in December as 38,534 bales of which 22,650 bales were American, says a cable to the Department of Commerce from Commercial Attache Charles H. Cunningham, at Madrid. Stocks on hand on Jan. 3 stood at 108,996 bales. Previous estimates place the total Spanish receipts of cotton from Aug. 1 to Nov. 30, at 102,000 bales.

Cotton Statistics Bill

Proposed Legislation on Time and Extent of Reports

Washington, D. C.—Cotton crop estimates would be published twice each month instead of once by the Department of Agriculture and acreage reports based upon farmers' intentions to plant would be discontinued, under the terms of a bill introduced in the Senate and House respectively by Senator Harris, of Georgia, and Representative Swank, of Oklahoma. The bill was favorably reported to the Senate last Tuesday by the Committee on Agriculture. To the extent that the bill would authorize a crop report twice each month and its simultaneous release with the cotton ginning report of the Census Bureau, the recommendations of the trade advisory committee appointed by Secretary of Agriculture Wallace are adhered to. That committee, however, approved the intentions to plant report.

The semi-monthly crop reports would be issued commencing as of July 1 and ending with December 1, and would be accompanied by the ginning reports as of August 1, August 16, September 1, September 16, October 1, October 18, November 1, November 14, and December 1. The two reports would be issued from the same place at 11 a. m. of the eighth day following that to which they relate. When the release date falls on a Sunday or legal holiday the report would be issued at 11 a. m. of the next succeeding work day.

A bill also was introduced by Senator Harris and Representative Rankin, of Mississippi, amending the present law authorizing the Director of the Census to collect and publish cotton statistics. It would direct the collection and publication of reports stating the amount of cotton ginned, cotton consumed, baled cotton on hand, the number of active spindles, and the quantity of cotton imported and exported, with the country of origin and destination. The cotton ginning erports would be required to show that the quantity ginned from each crop prior to August 1, August 16, September 1, September 16, October 1, October 18, November 1, November 14, December 1, December 13, January 16 and March 1, and would be released on the eighth day following at 11 a. m. The other reports referred to would cover a calendar month, to be issued as soon as possible after the close of the month concerned. The ginning report also would carry with it the latest available statistics of cotton consumption, stocks, active spindles, and imports and exports. The canvasses of August 1 and August 16 to determine the amount of cotton ginned could be limited by the Director of the Census to those sections of the cotton-growing states in which cotton has been ginned. All reports of the Census Bureau would be made public directly and also furnished to the Department of Agriculture for publication in connection with the cotton crop reports. The Director of the Census would also be directed to compile any available information concerning production, consumption and stocks of cotton in foreign countries and the number of active spindles in such countries.

A committee was appointed at that conference consisting of Representatives Rankin, of Mississippi, Oliver, of Alabama, Wingo, of Arkansas, and Swank, of Oklahoma, and Senator Harris, of Georgia. That committee subsequently agreed on the measures that have been introduced.

New Artificial Silk Name

The committee representing various trade associations which has been considering the matter of a new name for artificial silk, has finally decided on one choice — Glos. This devision will be referred to the associations for approval before final adoption. If such confirmation is received it is understood a publicity compaign will be undertaken to familiarize the trade and the consuming public with this new name.

Textile Luncheon

More than 100 members of the Philadelphia Textile Manufacturers Association attended a luncheon and "get together" meeting at the Bellevue-Stratford Hotel on Thursday, Jan. 24. After enjoying an attractive luncheon the members were addressed by Dr. Francis Harvey Green. It is the intention of the association to hold such meetings regularly so manufacturers may become better acquainted and meet others connected with the trade.

Textile Dyers and Finishers

At a joint meeting of the New England Textile Dyers' Association and the National Association of Textile Finishers to be held at the Hotel Biltmore, Providence, R. I., Feb. 2, the members will act upon a recommendation of the executive committees of both organizations that they be consolidated.

Quartermaster Asks Bids

The Philadelphia Quartermaster Depot, 21st St. and Oregon Ave., has sent out requests for bids on 15,000 yds. nainsook, 36 inches wide, and 13,500 yds. white madras, 32 inches, which will be opened on Jan. 28, at 11 A. M. On Feb. 1 at 11 A. M., the Depot will open bids on 7,500 yds. olive drab cloth, worsted warp and woolen filling, 17.5 to 18.5 ozs. per linear yd., 72-inch to 74 inches wide, for spiral leggins.

Heads R. I. Association

Theophile Guerin, president of the Guerin Mills, Inc., Woonsocket, R. I., was elected president of the Rhode Island Textile Association at its annual meeting Thursday of this week.

Cotton and Goods Prices

Proportion Charged from Producer to Consumer

How the consumer's dollar is divided among the various agencies engaged in the production and manufacture of cotton goods is revealed by the United States Department of Agriculture in a preliminary report of an analysis it has made of the difference between the retail price of cotton cloth and the price of cotton. Four types of cloth—sheeting, gingham, calico, and percale—are discussed in the report.

Out of the consumer's dollar spent for sheeting in 1922 the cotton grower received 19.8 cents. The difference between the grower's price and the quotations on the New Orleans Exchange was 3.1c. It cost 1.3c for transportation to the New England market. There was a difference of 39.3c between the price for cotton in New Orleans and the price of finished cloth in New England. This 39.3c paid for miscellaneous cotton handling and carrying charges, for the cotton dealer's service and for manufacturing the cloth from raw cotton as well as the selling expense. The retailer's and jobber's margin combined was 36.5.

In the case of gingham in 1922, the consumer's dollar was found to be divided as follows: 15.1 cents to the grower; 2.4c accounts for the cotton handling and assembling charges intervening between the grower and the quotations on the New Orleans Exchange; 1c for transportation to New England; 53.4c for the combined manufacturer's service including selling, cotton dealer's service and miscellaneous cotton handling and carrying charges; 28.1 for the combined retailer's and jobber's margin which includes transportation of the finished cloth from the jobbing center to the retailer.

Of the dollar spent for calico, in 1922, 20.4c went to the grower; 28.8 cents went for manufacturer's and cotton dealer's services and miscellaneous cotton carrying and handling charges; 2.1c. for assembling charges intervening between the grower and the New Orleans Exchange; 1.4c for freight New Orleans to New England; 17.7c for the selling agent's service for bleaching and printing as well as the necessary financing charges; and 29.6c for the retailing and jobbing margin.

Cotton manufactured into percale yielded 20.1c to the grower; 41.6c for manufacturer's margin, selling agent's commission, cotton dealer's margin and miscellaneous handling and carrying charges; 2c for assembling charges in the South; 1.3c freight from New Orleans to New England and 35c. for retailing and jobbing margin.

Retailers and Jobbers' Margins

Retail mark-up on cotton goods, says the report, varies from around 25% to 50% of the selling price. For the more staple types of piece goods 33 1/3% of the selling price is commonly the "attempted" mark-up. But sales and reductions forced by soiled goods and style changes usually give the store an actual mark-up somewhat less than the planned mark-up. It is noted that the operating expenses of 301 department stores in 1921, according to the Bureau of Business Research of Harvard University, averaged 27.8% of net sales.

Jo' bing margins vary from 5 to 12% of the jobber's cost price on white staple goods to from 10 to 25% on colored style goods.

Manufacturing margins have not been isolated from the data compiled. They are, however, the largest single item in the spread between the price of raw cotton and the price of cotton cloth. Manufacturing service in cotton cloth production involves a high labor expense, approximating 62% of the total expense in some mills. There is heavy expense for investment charges on machinery and equipment. Waste of cotton is also a big item, amounting for print cloth and similar goods to around 15% by weight.

Fall River Combine

To Vote Jan. 30 on Purchase of Tecumseh by Davol Mills

Fall River, Mass.—Special meetings of the stockholders of the Tecumseh and Davol mills were called for Wednesday, Jan. 30, to consider a proposition whereby the Davol will acquire the Tecumseh mills by purchase. The stockholders of the Tecumseh will be asked to consider the proposition to sell the land, buildings, machinery, supplies and stock in process of the corporation to the Davol for $1,000,000 and that the Davol be given the option to pay for the property in cash or its equivalent in increased stock at its par value, to be distributed pro rata to the Tecumseh stockholders in liquidation of their share of the purchase price.

The Tecumseh directors recommend the latter choice, in which event the capital of the Davol mills will be increased from $500,000 to $1,500,000 and the stockholders of the Tecumseh will receive one and one thirds shares of the Davol mills for one share of the Tecumseh. Cotton and cloth on hand, accounts receivable and Liberty bonds of the Tecumseh mills are not to be included in the sale, it being proposed to distribute these assets and other properties as a dividend as soon as they can be converted into cash and deduction made for taxes and expenses of liquidation and dissolution. It is estimated that the cash dividend will amount to about $100 per share.

The Tecumseh is one of the oldest mills in the city. It was organized in 1866 and it has proved a paying organization, especially under the management of the late Frank H. Dwelly and the present treasurer, Simeon B. Chase. The latter was first elected

treasurer of the corporation in 1875 but he resigned from the position in 1887 to go to the Merchants. He, however, resumed the management of the Tecumseh in 1908.

The Tecumseh mills are devoted to the manufacture of print cloths and specialties, are equipped with about 80,000 spindles and 1,700 looms and employ about 550 hands. They are capitalized at $750,000 and in the last annual financial statement showed a surplus of nearly $800,000. The Liberty loan account at that time was $233,081.68, and the cash, bills and accounts receivable totalled $346,230-55. The stock is quoted at 170 bid.

The Davol mill has a capital of $500,000, and it is equipped with about 46,000 spindles and some 1,300 looms. The mill turns out sateens, prints and fancies. Operating in full, the plant employs about 500 hands. The corporation had quick assets of, $388,165.95, and a surplus of $364,-794.50 at the close of the last fiscal year. The stock is quoted at 107 bid.

Seaconnet Meeting

FALL RIVER, MASS.—A special meeting of stockholders of the Seaconnet mills was called for Jan. 24 for the purpose of electing a new treasurer to fill the vacancy occasioned by the resignation of William N. McClane, and to authorize the directors to reorganize the corporation by reducing the capital stock and then increasing the same, and if so, to determine the amount thereof and the methods of carrying the same into effect. The call for the special meeting was accompanied by a balance sheet giving in detail the financial condition of the corporation as found by special audit. The audit shows a deficit as of Dec. 31, of $555,128 and there is an additional claim made by the Government for Federal taxes, amounting to $250,000, which is being contested.

Ask Vendor's Prior Lien

At a meeting in Toronto, Canada of the British Agents Association, which is composed wholly of textile men, the proposition to amend the Canadian Banking Act so as to take away from the banks the power of hypothecating goods ahead of the vendor was favored and an attempt will be made to have all invoices of textile goods shipped from England bear a clause that the vendor will have a prior lien on shipments coming into Canada.

Wool Growers' Convention

The 59th annual convention of the National Wool Growers Association convened last Tuesday at Salt Lake City, Utah. Financing the live stock man was the chief item for discussion. The fact that much of the money now borrowed is limited to six months was criticized as a handicap.

Wm. M. Wood Optimistic

Consumer Has Money and Raw Wool is Firm, He Says

LAWRENCE, MASS.—That William M. Wood, president of the American Woolen Co., is optimistic as to future business, is indicated in a recent statement made public through the company's monthly publication. The statement was as follows:

"There has been a slight slowing up on account of weather conditions in the clothing trade. However, this should be more than compensated by the remarkable progress and overwhelming amount of work being done in the building lines. Thousands of people who might have been thrown out of work on account of severe weather have been employed continuously and profitably at high wages, allowing them a great deal more money to spend at the time of the year when they naturally would have to curtail.

Money Seems Plentiful

"Money seems to be plentiful and is cheap and the banks are expressing an extreme willingness to lend money to any honest business man for honorable business purposes; in fact they are continuously encouraging business enterprises that are sound.

"Statistics of the great farming States prove conclusively the growth and enormous volume and great amount of increase in money value of farm products. They also show that the farmer is rapidly regaining this strength and is getting higher prices right along for his products.

"Statistics of the great mail order companies dealing direct with the farmers prove in their enormous increase that the buying power of the farmer is rapidly increasing and has already reached a very satisfactory volume.

"In regard to the woolen situation both here and abroad, the wool market is very firm, wool is in strong hands in primary markets and also the London markets have reflected great and increasing strength. Large countries abroad have come into the market and have bought enormous weights of wool.

Conditions Sound

"Observation of the foreign piece goods markets has given us every reason to believe that we are producing in this country both worsteds and woolens on a quality par with any in the world, and as far as price is concerned, we are selling better merchandise and more modernly styled for less money than any other country in the world, intrinsic value considered, and although the woolen market gives every indication of being firmer, the customers of the American Woolen Co., can rely on the hitherto highly successful, farseeing policy of our company to provide woolens in such quantity, quality and at such prices as will insure our customers the very best merchandise at the very lowest prices, enabling them to compete in this market or in any other market favorably, and there is every reason to be encouraged. The clothiers may also look forward to a regularly good business.

"Summarizing the situation, I can say in a few words that the condition of the country never was more sound and that looking east, west, north and south, there seems to be not even the shadow of a cloud upon the financial and industrial horizon; that the government is in strong hands and is more than ever mindful of the requirements and necessities of its people and is safeguarding their interests in every way; that the stocks of merchandise on the shelves of the distributors are at a very low ebb and that nothing that can now be foreseen is likely to occur to mar the continuance of a very prosperous and successful year for 1924."

Production Costs Private?

Argument Before Tariff Commission on Disclosing Data

WASHINGTON, D. C.—Production costs do not constitute trade secrets of a producer or manufacturer, Porter J. McCumber, former senator, declared at a hearing before the Tariff Commission last Wednesday. Nothing is a trade secret, in Mr. McCumber's opinion, except a method or process of conversion not generally known. He referred to the fact that he was chairman of the Finance Committee of the Senate when the 1922 Tariff Act was drafted. No one in the Senate at the time the bill was under consideration, he said, ever contended that a trade secret means anything else than a conversion process.

There is now pending in the Supreme Court of the District of Columbia a petition filed by the Norwegian Nitrogen Products Co., of New York, an importing firm, for a writ of mandamus to compel the Tariff Commission to disclose cost data submitted to the Commission by the American Nitrogen Products Company of Seattle, a domestic producer, in connection with the latter's application for an increase of 50% in the tariff duty on sodium nitrite. In answer to the importing firm's petition the Tariff Commission contended that the production costs of a particular company form a part of the trade secrets of that company and as such are protected by the law.

The court case was referred to by Commissioner Lewis in replying to Mr. McCumber's argument. If the Commission takes that view it will find a court that will not agree with it, Mr. McCumber answered. He did not contend that the Commission should divulge such costs data when it had given a pledge of confidence in obtaining it but he maintained that under the law the Commission is empowered to obtain cost production figures without giving its promise they will be regarded as confidential.

Are Cotton Mills Unhealthy?

Record of Pinert Brothers Effective Argument against Statement

After all these years of agitation for better sanitation in the factory, it is interesting to note the record of continuous service that has been made by Emil, Fred and Albin Pinert, three brothers, whose service totals 110 years.

The record of service is exceptional in any line of industry, but when we consider the volume of propaganda that has been spread broadcast in the past twenty years about the unsanitary conditions that surround the workers in the textile industry, the record takes on an added interest, because the Pinert brothers are em-

Pinert Brothers, ages 69, 71 and 74 years, employed by Lancaster Mills, Clinton, Mass.

ployed in the Lancaster Cotton Mills, at Clinton, Mass.

Two of the brothers have spent their broad span of service in the weave rooms of the plant. The weave rooms of the Lancaster Mills have not been any more sanitary or conducive to longevity than the rooms of any other plant doing similar work, so that when we remember the statements made in the daily press and in the various legislatures, of the mill hands in the textile industry being physical wrecks, with lungs filled with lint and dust, after ten, or twenty years at the utmost, one wonders whether most of the statements were fancies rather than facts.

Are the Pinert brothers at the ripe ages of sixty nine, seventy one and seventy four, decrepit, bent and shaking, ready for the retired list? This is far from the case and either one of them would pass for fifty-five or sixty and would be considered exceptional even for that age.

Five years ago the Lancaster mills put into effect a pension system and have now a list of ten persons on the roll, all of whom have a record as good or better than the Pinert brothers. About 200, or about 10%, of the employes in the factory have now passed the thirty-year mark for service. Many of the employes now at the plant can beat the fifty-five year record of Emil Pinert the family record is exceptional.

THE PERSONAL PAGE

Gen. L. D. Tyson, of Knoxville, formerly president of the American Association of Cotton Manufacturers, has formally announced his candidacy for the Democratic nomination for United States Senator from Tennessee and opened headquarters in Nashville. Indications are he will make a strong race. The democratic nomination for Senator is usually regarded as equivalent to election.

At the annual meeting and luncheon of the Consumers' League of Mass., held at the 20th Century Club, Boston, on Jan. 22, Robert Amory, president of the National Association of Cotton Manufacturers and Mrs. Ethel L. Best of the Federal Women's Bureau, investigator for the bureau in the cotton industry, spoke on the bill permitting double shift work for women in the textile industry in New England.

B. E. Geer, president of Judson Mills, Southern Worsted Co. and Southern Franklin Process Co., Greenville, S. C., has been elected president of the American Bank & Trust Co., Greenville.

Wm. H. Folwell, of Folwell Bros. & Co., Inc., Philadelphia, is chairman of a committee in charge of arrangements for a dinner to be tendered to Mayor Kendrick by the Manufacturers Club of Phila., on Thursday, Feb. 14. Among the prominent textile men serving on this committee are John Fisler, of Yewdall & Jones; Nathan T. Folwell, of Folwell Bros. & Co., Inc., J. D. C. Henderson, of Henderson & Co., Walter D. Larzelere; and Chas. J. Webb of Chas. J. Webb & Co., Inc., all of Philadelphia.

C. A. Cannon, president and treasurer of the Cannon Mfg. Co., Kannapolis, N. C., was in Philadelphia during the week, greeting his many friends in this city.

Among the directors of the Morris Plan Bank, Lawrence, Mass., recently elected, are the following mill men: George E. Kunhardt, of the G. E. Kunhardt Corp.; Charles H. Kitchen, cashier of the Washington Mill; Walter M. Lamont, agent of the Wood Worsted Mill; James A. MacDonald, superintendent of the Arlington Mills, and George H. Simonds, treasurer of the Brightwood Mfg. Co., North Andover.

W. Irving, Bullard, treasurer of the National Association of Cotton Manufacturers, and vice president of the Merchants National Bank, Boston, is the "field marshal" of the annual financial canvas started by the Boston "Y," and associated with him on the executive committee are the following textile men: Harry C. Meserve, secretary National Association of Cotton Manufacturers; Ernest Lovering, treasurer Lyman Mills, Holyoke, Mass.; Henry G. Lord, president, Bragdon, Lord & Nagle Co., Boston, and Richard M. Everett, of Lawrence & Co., Boston.

Dr. Stratton, president of the Mass. Institute of Technology, Cambridge, Mass., entertained the members of the technical committee of the National Association of Cotton Manufacturers, and several other members of the association interested in research work, at a luncheon on Wednesday and discussed methods by which the Institute and the industry might cooperate to mutual advantage.

Albert Farwell Bemis, past president of the National Association of Cotton Manufacturers, gave an illustrated lecture on India in the laymen's lecture course at the Old South Church, Boston, Friday evening, January 11. Mr. Bemis arrayed in his costume of the Punjab showed a large number of pictures he had himself taken, including among other things the processes of retting and manufacturing jute in the mill district of the Hoogly River, where

R. B. Jacobs, treasurer of Everett Knitting Works, Lebanon, N. H., elected president of the New Hampshire Manufacturers Association at Manchester as noted last week.

is located the Indian plant of the Bemis Bros. Bag Co., of which he is president.

J. B. and B. N. Duke have given Guilford College in North Carolina, $25,000 each to be added to the endowment fund of the college. The Duke brothers were students at this college and have given liberally to it at various times.

Daniel E. Rhyne, prominent textile manufacturer of Lincolnton, N. C., has bought the Piedmont Wagon & Mfg. Co. at Hickory, N. C., paying $425,000 for the property. E. P. Rhyne, nephew of the Lincolnton capitalist, is manager of the plant.

W. J. Westaway, head of the W. J. Westaway Co., Ltd., textile mill supplies and designers, Hamilton, Ont., was elected president of the Great Northern Power Co., at a meeting of directors in Toronto. The company is developing power on the Montreal River and at points in New Ontario.

Nathaniel Stevens, president of the M. T. Stevens & Sons Co., North Andover, Mass., has been reelected president of the National Bank of Andover, Mass.

Harry W. Goddard, president of the Charlton Woolen Co., Charlton City, Mass., has been elected a vice president of the People's Savings Bank, Worcester, Mass., to succeed Alexander DeWitt, deceased.

Many prominent textile manufacturers have been elected to the directorate of Amsterdam banks for the ensuing year. L. E. Harrower, head of the Anchor Knitting Mills, and H. L. Shuttleworth, president of the Mohawk Carpet Mills, Inc., have been elected directors of the Farmers National Bank; A. V. Morris, of A. V. Morris & Sons, was named a director of the First National Bank and Theodore J. Yund, of Yund, Kennedy & Yund, will serve on the board of the Amsterdam City National Bank.

Allan C. Emery, of Studley & Emery, wool merchants, Boston, was elected president of the Evangelistic Association of New England at its recent 37th annual meeting.

John Sanford, president of Stephen Sanford & Sons, Inc., Amsterdam, N. Y., is spending several weeks in Florida.

S. R. David, of S. R. David & Co., Inc., Boston, and Mrs. David, sailed from New York, Jan. 22, on the S. S. Empress of Britain for a month's cruise, visiting the West Indies, Panama Canal and the northern coast of South America.

Dr. Homer Gage, president of the Crompton & Knowles Loom Works, Worcester, Mass., has been elected medical referee of the State Mutual Life Assurance Co., of that city.

W. J. Roddey, president of the Victoria Cotton Mills, Rock Hill, S. C., left recently for a trip around the world. He will be away six months or longer.

H. Edward Jefferson, of Edward Jefferson, Philadelphia, arrived in England last week on the Majestic. He will spend three weeks in England visiting the various plants they represent in America.

E. A. Bregenzer was elected vice president and general manager of the Bethlehem Silk Co. at the recent meeting of directors. Mr. Bregenzer succeeds Harry C. Seaton, who died recently. Other officers were reelected for the ensuing year.

The following mill and machinery officials have been reelected officers of the Merchants Trust Co., of Laurence, Mass.; Vice president, Fred C. McDuffie, treasurer of the Everett Mills; directors, George E. Kunhardt, of George E. Kunhardt Corp., Inc.; Walter E. Parker, agent of the Pacific Mills; George H. Simonds of the Brightwood Mfg. Co., North Andover; Irving Southworth, assistant agent of the Pacific Mills; Albert H. Chamberlain, treasurer of the Arlington Mills; Arthur B. Emmons, treasurer and manager of the Emmons Loom Harness Co.; George W. Hamblet, Hamblet Machine Co.; Charles W. Walworth, president of Walworth Bros., Inc.; and George L. Wright of Davis & Furber Machine Co., North Andover.

G. Edwin Bartow has become associated with the Norrie Mills, spinners and weavers of flax, and will be in charge of the New York office at 350 Broadway.

Horace A. Carter, treasurer of the William Carter Co., Needham Heights, Mass., accompanied by Mrs. Carter and Miss Esther Carter, Springfield, Mass., will sail from New York on the S. S. Empress of Canada on Jan. 30 for a six months' tour around the world.

Edward Wells, treasurer of the Diana Knitting Co., Johnstown, N. Y., was reelected president of the Peoples Bank of that city at the annual organization meeting.

E. W. Bullard, erroneously reported as superintendent of the Anniston (Ala.) Yarn Mills, is treasurer of that organization. J. T. Gardner, former treasurer, is now president, and John A. Wilson remains superintendent.

David E. Hobson of Southbridge, Mass., has been elected assistant treasurer of the Fiskdale (Mass.) Finishing Co., succeeding Francis N. Woodman, resigned.

Alfred Thomas of the Edgeworth Mills, Worcester, Mass., has been elected a director of the Oxygen Process Corp. of New England, Worcester, Mass., which has been incorporated with $250,000 capital to manufacture commercial gas. He is also one of the incorporators.

Joseph P. Sgueglia, foreign representative of Brewer & Co., Inc., Worcester, Mass., heavy chemicals, returned on Jan. 17 from a four months' tour of Europe.

Edgar Thewlis, managing director of Thewlis & Co., Ltd., successors to Thewlis Sellers & Co., Huddersfield, England, arrived in this country last week on the Ansonia. He will spend several weeks in this country visiting the various textile centers here and in Canada. He will make his headquarters with Edward Jefferson, Philadelphia, the representative of his firm here.

George S. Waterman, manager of the William Whitman Co. southern cotton yarn department, Boston, has been elected a director of the Manchester Mfg. Co., cotton yarns, Macon, Ga.

Carl Schlachter, general superintendent and a director of the Botany Worsted Mills, Passaic, N. J. was recently elected chairman of the Industrial Council of Passaic Wool Manufacturers for this year, succeeding Julius Forstmann, president of the Forstmann & Huffmann Co. Christian Bahnsen, president of the New Jersey Worsted Mills, was elected vice chairman, to succeed Mr. Schlachter. J. Frank Andres was re-elected secretary-treasurer.

Robert Lindsay has been appointed resident manager of the Fiskdale (Mass.) Finishing Co.

TECHNICAL SECTION

Steam-Loss Prevention in Finishing*

Methods Installed at Mount Hope Finishing Company to Keep Accurate Records and Effect Economies in the Generation, Distribution and Utilization of Steam and Power—Cooperation of Overseers With Power Department—Charging Steam Used to Cloth Processing Departments

By *H. M. Burke.***

(Concluded from Dec. 29 issue.)

THE most elaborate and apparently foolproof systems and equipment will be of no avail if not properly cared for. Metering devices do require care, though not as much as the nonbeliever in them would have one think. However, if one is not satisfied with rule-of-thumb methods and is looking for better and more intelligent ways to reduce costs and prevent waste of steam, he will in a systematic way and at a negligible expense keep his instruments in first-class working order.

If the steam user is being charged too much or too little it will be reflected either in the increase or decrease of his bonus. If his bonus increases abnormally, an investigation is started by the cost department as the abnormal condition will affect the cost of the product produced. If the bonus decreases, the employe is the one who looks into the meter.

If the power despatcher becomes inclined to take things easy in spite of all others, he still has the chief engineer to reckon with—his production of unnecessary steam is reflected in the monthly cost figures upon which the cost of the product is based, and he will not stand for high costs when they take money out of his pocket.

Isolated instruments are a source of inefficiency. It has been found in the plant under consideration that instruments scattered around in dark corners permit a laxity on the part of the person caring for and using them. Hence all instruments are centralized where possible, and where this is not practical they are located at points nearest and most convenient to those using them.

Results

The results of the system have greatly exceeded anticipations as the savings made have greatly outweighed the expense incurred for meters, changes in pipe lines, investigation, and research. Acknowledgment is made of the practical value of the method of mastering power production established by Walter N. Polakov, of New York, whose services were secured by the company in February, 1922, and who, after a minute survey of the plant, reported that "the absence from this report of recommendation of any radical changes is plainly an indication of the high standing of plant engineering done in recent years." This clean bill of health, it may be said, has served as an inducement to strive for a higher degree of perfection.

Previous to the beginning of this work the average apparent evaporation secured at the plant was 12.55 lb. of steam per lb. of fuel oil, corresponding to 72% thermal efficiency. The latest record at hand indicates an efficiency of 83%, or over 15% improvement.

At the beginning of the work the estimate of possible annual savings was:

In generation	$40,000
In distribution	15,000
In utilization	25,000

At the time of writing this paper the evidence on record shows the following yearly savings:

In generation	$39,760
In distribution	12,320
In utilization	24,800

The work is still in progress. The savings enumerated above, it may be said, represent only a few items.

Actual progress in building up the efficiency of steam generation, as illustrated in Fig. 4, is for convenience of study subdivided into four periods corresponding to the stages in progress: namely,

	Ratio of apparent evaporation
1 Preliminary observations From January to March, 1922	12.56
2 Introduction of New Methods From April to Sept. 1922. Gradual improvement, average	13.28
3 Fixing New Habits From October, 1922, to May, 1923	13.87
4 Extension of Plant From June to August, 1923	14.21

During the last three months when the new extension of the company's boiler house was in service the records of monthly performance on a 24-hour basis, 7 days in the week, were as follows:

	Average evaporation lb.	Equivalent evaporation lb.	Thermal efficiency per cent
June	13.9	15.01	80.1
July	14.6	15.78	83.0
August	14.4	15.49	82.6

However, the results obtained by research and subsequent changes made are sometimes quite difficult to calculate in dollars and cents. For example, a simple change in shutting off main pipe lines to distant parts of the plant over week ends and

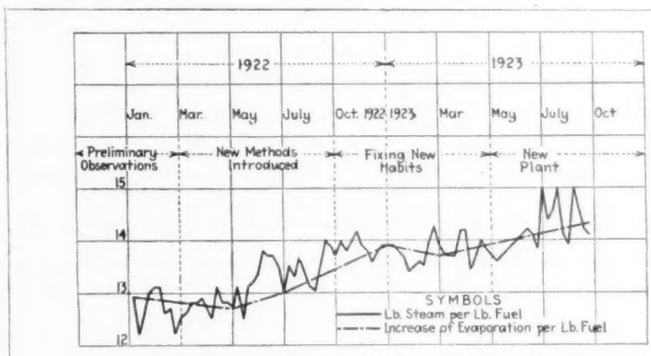

Fig. 4. Chart Showing Progress Made in Building Up Efficiency of Steam Generation

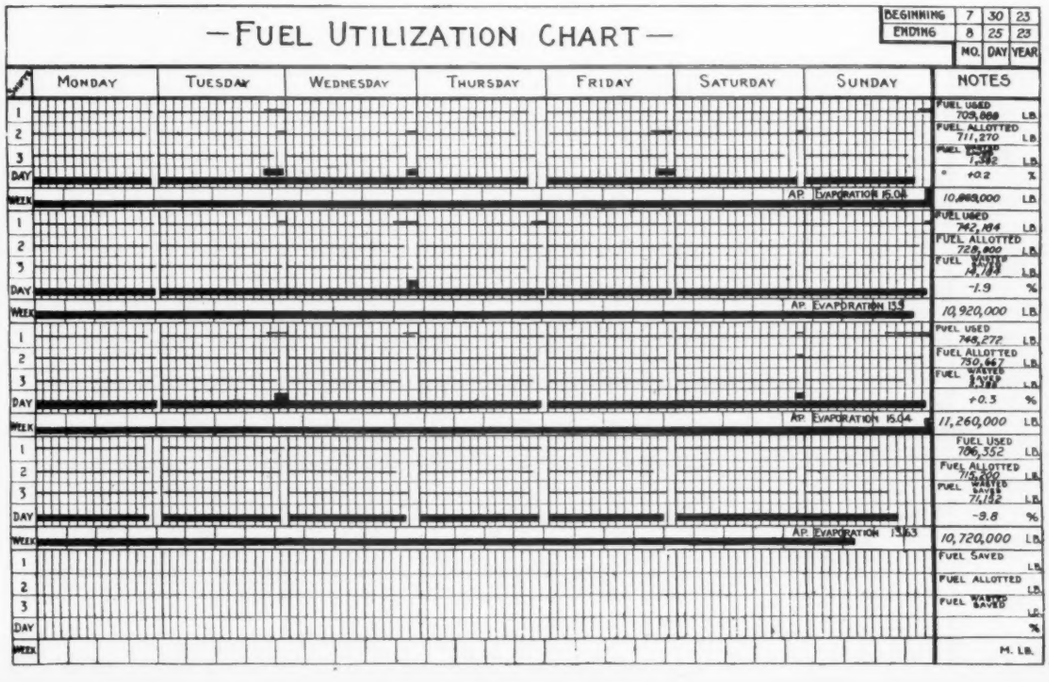

Fig. 5. Fuel-Utilization Chart

* Paper presented at meeting of Textile Division, A. S. M. E.

** Plant engineer, Mount Hope Finishing Co.

Another Miracle by John Bright

He reclaimed a batch of silk hosiery for Meyer & Reimet, Silk Dyers, which had been all but ruined by using Epsom Salts instead of Glaubers Salts in the dye bath. When John arrived the lustre of silk was destroyed and the hose water spotted and covered with dirty lumps of magnesium salts which could not be removed.

But John made the hose as good as new with International No. 56.

Let us solve your problems—whether it be the cleaning of floors and vats or a most valuable piece of fabric. Have you our latest folders on Kleaning Kinks in the Textile Industry? They're free. Just send for them.

to clean RIGHT ask JOHN BRIGHT

INTERNATIONAL CHEMICAL CO
PHILADELPHIA ----- PENNA

THE TRADE MARK OF

QUALITY

ALKALI

IN ALKALIES

Soda Ash ▲ Caustic Soda ▲ Bicarbonate of Soda
Modified Soda ▲ Special Alkali ▲ Textile Soda

Diamond Alkalies are Manufactured and Sold Direct to the Consumer by

DIAMOND ALKALI COMPANY

PITTSBURGH ▲ PENNSYLVANIA

heating warehouses and rooms where work could be more efficiently carried on in lower temperatures, made it possible to effect an annual saving of about $3000.

Reduced steam pressure in caustic evaporators produced the following economies:

Average weekly caustic recovery, lb.	72,000	71,800	86,786
Steam consumption, lb.	838,462	650,109	799,515
Pounds of steam per pound of caustic	11.6	9.06	9.22
Saving, per cent		19	
Actual saving annually			$3,800

Utilization of steam in various processes presents the most complicated yet the most promising line of research. With a steam consumption of about 710,000,000 lbs. per year, the company spares no effort to work out methods to secure the same or a better grade of work with less steam. This means of course that each unit has to be studied separately. In this respect it makes no difference whether a plant is large or small, since the equipment used in large establishments is similar to that employed in very small bleacheries or laundries.

The results of the company's efforts in this direction may well be illustrated by examples.

A large amount of water required in a silk dye department was provided by two large storage heaters using live steam. Experiments established the fact that if exhaust steam were used instead of high-pressure the water could be heated to from 110 deg. fahr. to 210 deg. fahr. The following tabulation shows clearly the advantage in favor of low-pressure steam.

Steam used per week, lb.	2,870,441	2,048,035
Cost of steam per week	$1,200	$810
Weekly saving	.....	390
Annual saving	.....	20,000

On dolly washers the use of high-pressure steam to bring cold water to the boiling point was first changed by using steam of lower pressure with a resulting reduction of steam consumption of 30% or a saving of $3,200 annually. By supplying these washers later with hot water, preheated by means of excess of exhaust steam at a slight expense for piping, the following saving was made: Instead of heating water from 80 deg. to 210 deg. fahr. in the washer by live steam at 40 lb. pressure at the expense of 130 B.t.u. per lb., it was preheated with exhaust steam to 150 deg. fahr. and again heated up to 210 deg. at the expense of 50 B.t.u., securing 54% economy or the equivalent of an annual saving of $5,400.

It is not the prime object of the company's investigations into the uses of steam to effect changes in actual process work. Nevertheless from time to time enlightening information is brought out, such as that regarding the idle time that increases the expense burden by wasting steam and power to keep a machine in readiness during the idle period.

Records

Records are of the utmost importance to the plant engineer to carry on the work as planned, control the progress, and maintain the interest of the men responsible for performance.

General Records. An endeavor has been made to simplify and keep to a minimum the number of forms to be made out daily and to crystallize the generation-of-steam records into one form known as the Fuel-Utilization Chart.

This chart, which is reproduced in Fig. 5, shows the daily performance of each shift of firemen by indicating with a straight line the evaporation of water per pound of fuel. Each day is spaced into fifteen sections, the ratio of equivalent evaporation of 15 lb. of water for each pound of fuel oil. The evaporation attained by each shift is laid off by a straight line, the length of which shows how much the shift fell short of or exceeded the standard.

The results for the three shifts are in like manner laid out with a heavier line, the length of which is the average daily evaporation. The average weekly consumption is in turn plotted, and represents the sum of the average daily results in a continuous line which shows longer or shorter according to whether the evaporation was below or above the standard set.

On the right-hand side of this form it will be seen that the weekly consumption of oil is checked against the weekly allowance, and the saving or loss of fuel shown. This chart is posted in the boiler room for the firemen's inspection, and it is watched with as much eagerness as if it were a baseball score.

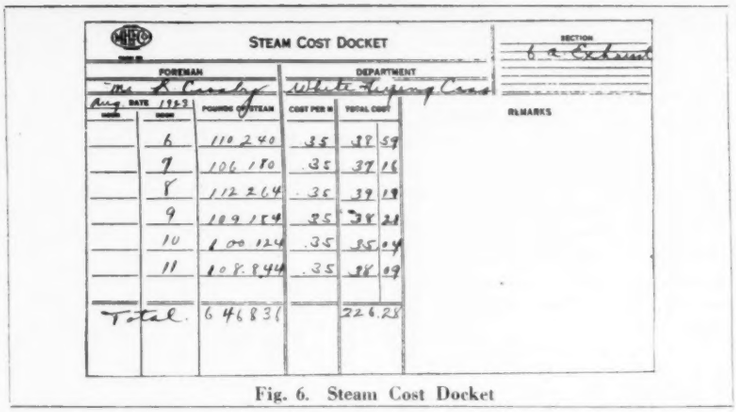

Fig. 6. Steam Cost Docket

Distribution Records. From the autographic records of the flow meters of the despatcher's office the power despatcher recapitulates, condenses, and compiles the statistics for the plant engineer.

The Power Despatcher's Summary records the total steam generated and distributed, showing by departments the consumption, the cost per 1,000 lb., and the cost per unit of merchandise processed.

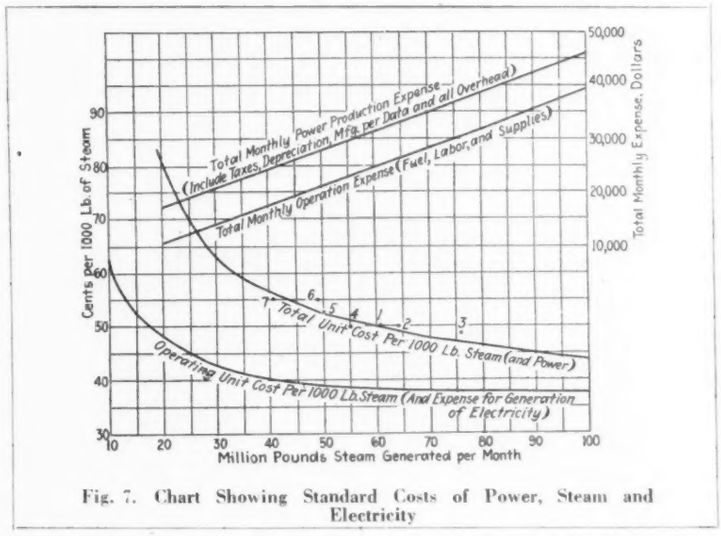

Fig. 7. Chart Showing Standard Costs of Power, Steam and Electricity

In addition to the above a weekly Steam-Cost Record is kept for each of the departments so that their respective fluctuations can be seen at one glance. The data for this sheet are taken from the Power Despatcher's Summary.

Steam Billed to Departments

One of the unique features of the system as operated is that the power plant is virtually an independent business carried on within the walls of the plant. It buys its raw product—fuel— and sells the finished product—steam—to its customers, the various departments of the plant. It pays rent for its housing and taxes, and it also has to pay for insurance and other fixed charges, labor and supplies, so consequently must charge for its finished product, steam.

It sends out bills weekly to each department for steam used, as shown by the steam flow meters, at cost of production. Exhaust steam costing less than high-pressure, its use is encouraged wherever practicable. (See Fig. 6, Steam-Cost Docket.)

For the benefit of the accounting and sales department the power despatcher prepares monthly a report showing the distribution of the power-plant expense to the various departments. This is accompanied by a statement of costs of various items that make up the total monthly charge, as compared with the costs of the same items for the preceding month.

It is interesting to compare each month the actual cost to operate the power plant with the figures given in the chart of predetermined costs, Fig. 7, and it is remarkable how closely the actual and predicted costs coincide. This chart is made up of four curves, showing

Total costs, including fixed charges.
Unit costs, including fixed charges.
Total operating costs, and
Unit operating casts.

The data from which these curves

(*Continued on page* 41.)

Fireproofing Textile Fabrics

Early Study of This Problem—Discussion of Processes—Possible Use of Electric Current

By *Ismar Ginsberg.**

IN ancient writings we read that the invention or discovery of fire conferred a great boon on the human race, provided it was used with care. Ever since, in spite of the utmost care that has been exercised in the use of fire and fire-producing agents, disasters have occurred. It was seen in very early times, in fact by the Romans, that there was but one sure way in which to prevent the destruction by fire of inflammable things and that was to render them fireproof. It is really remarkable that the Romans understood that the way in which to do this was to impregnate the combustible matter with non-combustible inorganic salts. Thus they fireproofed wood by steeping it in a mixture of vinegar and powdered clay. Of course this treatment did not positively fireproof the wood, although it did render it less liable to burn.

But the principle had been established and the modern methods of permanently fireproofing textile fabrics and other combustible materials of cellulosic character are based on the impregnation of the fibre with inorganic substances which, because they do not burn, render the material that they cover resistant to fire. It is also interesting to note that the fireproofing process was first applied

* Consulting Chemical Engineer, New York.

to wood for the houses were made of wood and were the most likely of a man's possessions to burn. In the fireproofing of textiles the principles are the same for the textile fibre, and here of course we talk principally of the cotton fibre for it is cotton which is mostly subjected to the danger.

Fabrics Used on the Stage

The history of the art of fireproofing cotton materials goes back to the year 1638, when a certain Nikolas Sabattini pointed out the danger, which is always present, of fire breaking out on the stage, not only because of the inflammable character of the wood employed in the construction of the theatre, but also on account of the inflammability of the cotton materials used in making the scenery as well as the clothes of the players. For the next two hundred years whatever progress was made in fireproofing was in connection with the protection of wood against fire. It was not till the year 1820, when the King of France, Louis XVIII, commissioned Gay-Lussac to make a practical study of the means of fireproofing fabrics and wood that attention was directed to the fireproofing of textiles. Since then, there have been many processes devised for accomplishing this, but practically all of them are just modifications of those methods which were originally proposed by Gay-Lussac.

Incombustible Substances

Theoretically of course it is impossible to prevent a combustible material from burning, but it is possible to render it so difficult to catch fire that for most purposes it may be called incombustible. Substances, which possess the property of conferring on cellulose the property of resisting fire, are called "ignifuges." These substances are generally nonvolatile mineral salts, which do not fuse, deliquesce nor absorb moisture from the air. The object of the fireproofing process is to get these salts into the cellulose fibre so that they adhere to it strongly and are not easily washed out again. The salts are made into solutions and the fabrics are steeped in these solutions or else the latter are painted or sprayed on to the cloth. After impregnation the volatile solvent is removed by heat and the solid substances unite with the fibre in a firm physical union.

The salts which are most generally used for this purpose are phosphates, borates, stannates, tungstates, molybdates, titanates, ammoniacal salts, boric acid, chlorides of calcium, magnesium and zinc, and silicate of soda. The most important of these are ammonium sulphate and ammonium phosphate, aluminum salts, borax, sodium stannate and tungstate. Zinc chloride is also very valuable for this purpose, as it is very readily absorbed by the fibre and as it confers antiseptic properties upon it, which is particularly advantageous under certain conditions.

Temporary Fireproofing

It is evident that while it may be a very simple matter to get the fireproofing materials into or onto the textile fibre, it may be just as easy to get them out again. In other words the mere washing of the fabric with or without soap may be sufficient to remove the fireproofing agents from the textile. Thus for example it is an easy matter to render the fabric fireproof by starching it with a mixture of starch and alum. Clothes treated in this manner will not burn, but unfortunately as soon as they are washed, the fireproofing is immediately removed.

There are many fireproofing preparations, which are highly recommended and which really do make the textile fireproof, but for a short time only. Thus a mixture of three parts by weight of phosphate of ammonia, two parts of sal ammoniac (chloride of ammonia) and one part of sulphate of ammonia in forty parts of water is very effective in fireproofing such goods as lace curtains and the like. But just as soon as the curtains have to be washed, the fireproofing is destroyed. It has then to be renewed or else the goods are as inflammable as if they had never been fireproofed at all.

This method of fireproofing cotton goods is accordingly extremely unsatisfactory, for it is evidently impractical to have the washwoman or laundry fireproof the fabrics after they are washed. It follows, therefore, that the only form of fireproofing which is really worth while is the permanent form, in which fireproofing agents are firmly incorporated with the fibres, which substances are difficultly soluble in water and so not easily washed out of the fabric.

Fireproofing Flannelette

Some of the most important work done to determine how to fireproof fabrics permanently was carried out in connection with flannelette. The famous English chemist, Dr. William Henry Perkin, made this material a subject for permanent fireproofing. By selecting a material which was particularly difficult to fireproof, a method was developed which could be applied with like success to all sorts of cotton fabrics. It is of course understandable that while it is desirous to render a fabric resistant to fire, it is equally desirable not to injure the fabric or affect any of its essential properties. Thus the original feel or durability of the cloth must remain unchanged. The fireproofing agents must not cause it to go damp as many chemicals do, and neither must they make it dusty. As many fabrics are dyed, the color must not be impaired and the design, printed on or woven into the cloth, must not be injured.

Then again no poisonous material must be used in the fireproofing process; salts of lead, arsenic and antimony for example cannot, therefore, be used in the same. Finally the fireproofing must be permanent, so that even fifty washings will not remove it, and it must be cheap. The resistance of the fireproofing to washing must be very high, for the modern laundry with its mechanical washing machines, and even the washwoman with her brushes and wash-boards do their very best to get everything, dirt and anything else that may be added to the fibre purposely or accidentally, out of it.

After trying out a great number of different chemicals it was found that good results and in fact a permanently fireproofed material was obtained by the following method. The cloth was first run through a solution of sodium stannate, approximately 45 degrees Tw., in such a manner that it became thoroughly impregnated with it. The fabric was then squeezed to remove the excess solution, passed over heated copper drums in order to dry it and then run through a solution of sulphate of ammonia of 15 degrees Tw. Then it was again squeezed and dried. The two solutions react with each other to form a precipitate of stannic oxide and also sodium sulphate. The latter is soluble and is removed by passing the cloth through a water bath. The fabric is then dried again and may be subjected to any of the regular finish-operations commonly performed on cotton goods.

Properties of Cloth

Of course the most advantageous property of this cloth is its remarkable resistance to washing with soap and water. It would appear as if the tin oxide were not present as such but in some combination with the fibres themselves. Besides being fireproof the fabric also retains and acquires other properties which enable it to be dyed and treated in the regular way with perfectly good results. Another important consideration is that the fireproofing agent, oxide of tin, has no injurious effect on the skin of the person who may wear clothes made from the fireproofed textile. This is highly significant as one of the essential characteristics of a fireproofing agent as pointed out above is that it should not be poisonous in any way.

It is possible to apply the same fireproofing process to other textiles with equally good results. Muslin, lace curtains and other cotton goods may be treated with these fireproofing agents and made perfectly resistant to fire.

There are of course other fireproofing processes which deserve consideration just as well as the one just described, exact details of which can be obtained from the article which appeared in "The Journal of Industrial and Engineering Chemistry," Jan. 1913, pages 57 to 61. Important research has been carried out on the problem of the amount of fireproofing agent and the concentration of the solutions used in the various processes that will produce a fire-resistant celluose.

Fireproofing compositions, containing ammonia salts, have been used since the early days of the art. The fireproofing effect of these salts is due to the fact that under the influence of heat they are easily decomposed with the evolution of ammonia fumes and other gases which choke the fire and extinguish it. Thus for example sulphate of ammonia is decomposed by heat to give nitrogen, ammonia gas and volatile bisulphate of ammonia. All these gases and vapors are non-supporters of combustion.

This phenomenon was taken advantage of very early and some of the fireproofing combinations advocated by Gay-Lussac contained ammoniacal salts. Sulphate of ammonia in combination with phosphate of ammonia was first used for this purpose. The fabrics were simply dipped in the solution of these salts and dried.

Ammonia Salt Within Fibre

It has been found that ammoniacal phosphate of magnesia possess very great fireproofing properties, especially when the salt is precipitated right in the fibres of the textile. To accomplish this the cloth is first impregnated with a 10% solution of phosphoric acid (calculated as phosphorus pentoxide) or more economically with a solution of any soluble phosphate (impure monocalcium phosphate or commercial superphosphate are said to give good results). After thorough impregnation the fabric is dried and then immersed in a bath of chloride of magnesium which has been made strongly ammoniacal. After drying, washing and final drying, the fabric is finished.

The precipitation of the fireproofing agent, ammoniacal phosphate of magnesia, right in the fibres themselves gives a product which is highly fireproof, for the chemical is firmly fixed to the fibre, does not dust and remains there indefinitely. For the phosphate is insoluble in water.

The alkaline silicates can be used for fireproofing fabrics, but not alone. For example the following formula has been known to give good results:

Graphite	100 grams
Sulphate of barium	80 grams
Carbonate of potash	60 grams
Ochre	10 grams
Phosphate of ammonia	20 grams
Solution of rosin in alcohol, 33%	30 grams

This mixture is then incorporated with 250 grams of a solution of commercial silicate of soda (water glass) 39 degrees Be. Silicate of soda has also been used in combination with oxychloride of magnesia. In another process the fabric is given a preliminary treatment in a bath of silicate of soda before immersion in a solution of chloride of lime. Another formula prescribes the use of 350 parts of silicate of soda and the same amount of asbestos mixed with one thousand parts of water. The silicate of soda preparations are not as effective fireproofing agents as the ammonia salt formulae, for the reason that the fireproofing is only loosely held by the fibres.

Boric acid and borax are used to

improve the fireproofing effect of ammonia salts. When subjected to heat the boron compounds melt and cover the fibres with a film of glass which prevents them from burning. It is claimed that the properties of the fabric are not altered or injured by the use of boron compounds.

Miscellaneous Processes

There are numerous other chemicals that may be used in fireproofing compositions, such as salts of alumina, zinc salts, etc. In fact the number of formulae for rendering fabrics fire-resistant are almost legion. All kinds of combinations may be made, but all of these usually contain one or more of the chemicals that have been discussed above. The prime function of the treatment is to get the incombustible chemical into the fibre and make it stay there as long as possible.

In this respect the problem is much similar to the waterproofing of fabrics. In an article which was published recently in TEXTILE WORLD, the author describes a new development in waterproofing which consists in employing the electric current to force the waterproofing agents into the fibres so that they are not easily removed. While no work as yet has been done on the fireproofing of fabrics by a similar process, there does not appear to exist any great difficulty in securing excellent fireproofed fabric by the electrolytic process.

It will be remembered that the chief advantage of the electrolytic waterproofing process is that the current actually forces the chemicals into the capillary structure of the fibres. As the fireproofing agents are also electrolytes, it stands to reason that the current can similarly be employed for this purpose. It may accordingly be possible to obtain a fireproofed fabric in this way which will remain fireproofed indefinitely. For it is a known fact that once a substance is made to penetrate into the internal structure of the cotton fibre, it is really a difficult matter to get it out again.

New Method of Printing

Results From Study of Changes in Cotton Rope—Process Now Awaits Commercial Exploitation

THE following interesting description of the metamorphosis of a cotton rope used in a textile mill drive and how it led to a new method of cotton goods printing is given in the current issue of the "Journal of the Society of Dyers and Colourists," by W. Warr:

About the year 1911 the writer examined an exceptional case of disintegration of a cotton rope used on a main drive, and the observations were considered to have a bearing on fundamental points in the chemistry of cotton cellulose. In consultation with C. F. Cross, the matter was further investigated and the results are referred to in "Researches on Cellulose, IV," also in the "Journal of the Society of Dyers and Colourists," 1918, page 247, and 1919, page 271. Following up these observations, the writer has devised a method of printing based on the changes of the cotton substance produced by mechanical means, and the matter is now deemed of sufficient interest to justify a fuller description.

The original observations concerned an ordinary white interstranded cotton driving rope of about 1-in. and a quarter diameter. This had broken after being in use for only a few months, whereas it ought to have lasted as many years. The belt was from a coil lying in stock and from the same coil other ropes were in work and little worse for years of wear.

Change in Rope

On making a clean cross cut of the defective rope, there was seen a centre of brownish powdery material having the appearance of having been scorched. A pencil was thrust into this centre as easily as it could have been into a tube. On untwisting the rope, each of the three strands had a side which was brown, frayed, and ragged, with every appearance of having been heated.

The examination of the powdery material showed it to consist of minute portions of cotton fibre, fine dust, and some small nodules resembling small grains of sago stained with tea. A suggestion that some lubricant had been worked in when manufacturing the rope and that this had turned acid was negatived, as nothing was found in the new rope in stock. The dust did not give an acid reaction when moistened.

Drive Which Caused Changes in Cotton Rope

An examination of the pellet-like pieces showed them to be hard and not easily cut with a knife, they did not powder when pounded in a mortar, sank quickly in water and gave no positive result when tested for starch, dextrine, etc. The cut surface of the pellets was not striated as though built up in layers, but had the appearance of having been moulded when plastic. They were very slightly transparent and the microscope revealed no ordered structure. The powdery particles which were smaller than rice starch granules were in the

(*Continued on page* 59.)

ONE 12-hr. Boil
instead of
TWO 8-hr. Boils
and
BETTER RESULTS

This Advertisement is one of a series based on actual occurrences at the [illegible]

THIS mill adopted Oakite after a careful tryout in kier boiling cotton tape. A small amount of Oakite and a reduced amount of caustic showed five profitable advantages:

1st: One 12 hr. kier boil with Oakite cleaned the goods better than two 8 hr. boils without Oakite.

2nd: They were able to discard the special treatment for removal of starch necessary before using Oakite.

3rd: They saved money on fuel because of one boil instead of two.

4th: They saved on labor through less handling of goods, and fewer hours of supervision.

5th: They were able to improve the finish—by better appearance and softer feel.

There is nothing experimental about the increased cleansing power of a kier formula utilizing a small amount of Oakite and a reduced amount of caustic. Many mills are now following this practice. There is no spotting or staining. Oakite assists the caustic in removing natural oils and waxes — and *emulsifies* any mineral oil present in the goods.

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There are 70 Oakite Service Men, cleaning specialists, located at: Allentown, Pa., Atlanta, Ga., Baltimore, Boston, Bridgeport, *Brooklyn, Camden, Canton, O., Charlotte, N. C., *Chicago, *Cincinnati, *Cleveland, *Dallas, *Davenport, Dayton, *Des Moines, *Denver, *Detroit, Erie, Flint, Mich., Grand Rapids, Harrisburg, Hartford, *Indianapolis, *Kansas City, *Los Angeles, *Milwaukee, *Minneapolis, *Montreal, Newark, New Haven, *New York, *Oakland, Calif., Philadelphia, Pittsburg, *Portland, Me., Poughkeepsie, Providence, Reading, Rochester, Rockford, Rock Island, *San Francisco, Schenectady, *Seattle, *St. Louis, Syracuse, Toledo, *Toronto, Utica, Waterloo, Ia., Williamsport, Pa., Worcester.

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It is an olive oil soap. Vastly superior to what is known as "blended soap" — made by small manufacturers who do not have the stores of raw material possessed by the Palmolive Company. Consequently small soap makers are compelled to cheapen their products by adding tallow or other low grade oils.

Every detail in the manufacture of Texolive soap comes under the careful personal supervision of highly efficient experts.

Therefore, because of the purity of the raw materials and painstaking manufacture Texolive is the perfect silk soap.

THE PALMOLIVE COMPANY
360 N. Michigan Ave., Chicago, Ill.

TEXOLIVE SOAP

QUESTIONS AND ANSWERS

Under this head, we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to TEXTILE WORLD. Inquiries should give the fullest information and data possible. In the case of damage to material, a sample should be sent. In this way answers can be given which will be of immediate technical value to the correspondent and to others in the same line. Inquiries pertaining to textile processes, machinery improvements, methods of management, the markets, etc., are especially invited as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith. The identity of correspondents will not be disclosed.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.—EDITOR.

Finishing Vellum Cloth

Technical Editor:

We are herewith enclosing a sample of vellum cloth. We would like to know what kind of machinery we ought to have for finishing this cloth. (5018)

Fabrics like the vellum cloth sample sent are finished on special filling machines. The first run is sometimes accomplished on what is known as a Tommy Dodd or back filling machine, after which the goods are dried over a regular cylinder drying machine. The second run is over what is known as an opaque finishing range, consisting of a special starch mangle with a bottom brass roll engraved with a pin or knurl pattern, this roll being fed by a blanket covered or feeder roll in the starch box and having a top rubber covered cushioned roll. This opaque padder or mangle runs in direct connection with an opaque drying machine of special construction and lays the goods down ready for sprinkling over a special brush sprinkler, from where they are taken to a heavy friction calender and given a friction finish, the calender operating with its highest degree of friction.

* * *

Ends Break in Weaving

Technical Editor:

We have recently gone on a class of goods like sample that is giving me considerable trouble. I will explain. The warp is 1/20s white cotton, 4,400 ends, reed 19½ by 3. The goods are woven on a cam loom, eight harnesses, 2 up, 6 down. Now the No. 1 and 2 harness get very tight and the others very loose, thereby putting the strain of the pull of the warp on No. 1 and 2 harness, causing the threads to break considerably. What could I do to remedy this condition? The warp is all on one beam and there is no chance to use two beams. Am sending you sample that requires 54 picks, but they are not all in on account of warp running bad. (5019)

We are assuming from the figures given that the reed is 19.5 dents per inch and the ends are drawn 3 per dent. The trouble seems to be in the reeding of the single ends, for an eight end repeat of the weave is not a multiple of three ends per dent. This would not affect the weaving to any extent if each end were weaving in as a pattern, but ends are weaving in as groups; that is, there is a group of six ends and a group of two ends, and each of these groups weaves as one end. If reeded three ends per dent there will be a split in the order of reeding and this split will affect the group of two ends and the group of six ends in different places in the reed.

Wherever a single end of one group is drawn in the same dent with the ends of the other group, the pull of one group against the other is too great, and the single end that is separated from its group cannot bear the strain as well as if it were working in the same dent as its own group. No single end from any group should be allowed to work in the dent with another group.

It would be much better to figure a reed that would permit the ends to be drawn in the following manner: 3 ends in one dent (from group of six ends); another 3 ends in one dent (from group of 6 ends); then 2 ends in one dent (group of 2 ends). This would give 3 dents for one repeat and while this would change the width of the pattern very slightly it would permit of reeding each group so that the group of six ends would be split in threes and the group of two ends would be in a separate dent. This would make for better weaving.

From the figures given, the width of the cloth would be about 66¾ inches and the width of the yarn in the reed would be about 75.18 inches. This means that the cloth contracts about 12.63%. If the yarn is reeded as suggested above there would be an average of 2.66 ends per dent in the reed. A total of 4,400 ends divided by 2.66 ends per dent gives 1,654 dents that would be used for the total width of the cloth. These 1,654 dents divided by 75.18 (width of yarn in the reed) would give 22 dents per inch for the new reed.

It would help this weave if the ends were drawn in as doubles and woven on four harnesses. This could easily be done even on the same side cams that are now being used. It would strengthen the yarn and it is obvious that two ends weaving together would run much better than a single end. If this were done the yarn would have to be drawn as suggested. No matter how the yarn is drawn in the harnesses, as long as the groups work together in the reed, that is, with no single end from one group drawn in the same dent with the ends of the other group, the weaving will be improved. The method of drawing-in would not show on the face of the cloth for the yarn is entirely covered by the filling.

The following is another suggestion and while it would take six harnesses it would not require any difference in the order in which the cams operate: From the group of six, draw three ends as one in one heddle and put in one dent of the reed; then draw the other three ends of this group as one in one heddle and put in one dent of the reed. The group of two ends would then be drawn as one in one heddle and put in one dent of the reed.

We would suggest that the warp yarn be sized well, for the filling is of such a nature that the fibres of the yarn are much disturbed when the pick is being beaten up into the fell of the cloth.

* * *

Waste in Processing Artificial Silk

Technical Editor:

If possible, kindly advise us what percentage of waste we ought to expect on throwing 6/3 artificial made from 150 denier "C" quality American viscose silk. Any information in regard to this matter will be greatly appreciated. (5022)

The following is from a large user of artificial silk: The waste in winding is from 4 to 6%. In the other processes the amount of waste will depend on what process you use for doubling and twisting and on what size bobbins you use. The larger the bobbin the less the waste, if bobbins are made properly. The doubling and spinning waste will vary from 2 to 6%.

* * *

Yarn for Hosiery Machines

Technical Editor:

We have a plant of 7/8 automatic machines for making hose as follows:

1—60 cylinder needles, 30 dial needles by 3½ inch diameter.
2—64 cylinder needles, 32 dial needles by 3¾ inch diameter.
2—68 cylinder needles, 34 dial needles by 3⅞ inch diameter.
4—72 cylinder needles, 36 dial needles by 4 inch diameter.
3—76 cylinder needles, 38 dial needles by 4 inch diameter.
1—76 cylinder needles, 38 dial needles by 4¼ inch diameter.
1—80 cylinder needles, 40 dial needles by 4¼ inch diameter.
1—80 cylinder needles, 40 dial needles by 4½ inch diameter.

What limits of yarn can be used on above machines, and is it correct to term them 18 gauge? Please give a rule to find latch needle gauge on hose and half hose machines. Also give the sizes of woolen yarn and worsted counts suitable for the above machines. What size machine (full automatic) is made that would produce a hose to duplicate the goods as made on machines mentioned above, and what quantities would they produce per day? What sizes of yarn would they use? What rule is used to calculate speeds of shafting, sizes of pulleys, etc. (5020)

Probably 6 cotton, with 1/5 as the heaviest and 1/7 as the lightest. Very much depends upon the skill of your fixer and the condition of the machines as to the range of yarn they can handle. However, the best production is to be had in the middle of the range always.

A 6 cut machine was 18 gauge at one time, but knitters demanded every possible way of cutting and the rule was forgotten long ago. Your machines might be either 12 or 24 gauge, but 18 gauge with 24 gauge dial needles would be more common.

A 1/6 cotton is equal to 1/9 worsted and this proportion holds for all sizes of yarn. An equivalent woolen yarn would be a 3.15 run or a 16.8 cut. The full automatic machines would need to be cut like your present machines to duplicate the goods you are now manufacturing. There are at least three excellent automatic rib machines on the market at this time. The speed of these machines varies from 120 to 235 r.p.m., depending in part upon the kind of work you manufacture. The production varies accordingly. The size of yarn would be the same as for the 7/8 automatics.

Multiply the speed of the driver by the diameter of the driver pulley and divide by the diameter of the driven pulley to get the speed of the driven shaft.

Treating Castor Oil

Technical Editor:

As you know, there is a great difference between the color of a sulphonated castor oil made from a No. 1 and a No. 3 castor oil. We understand there is a method of treating a No. 3 castor oil that upon sulphonating a color is obtained as good as No. 1 castor oil. It occurred to us that you probably might know of this process, and if you can consistently do so we would appreciate your letting us have this information. You must understand of course that this treatment of turning a No. 3 oil into a No. 1 must not cost too much in labor or loss of material to offset the difference between the cost of the two oils. (4989)

We are unable to learn details of a process for making the color of a No. 3 grade castor oil as good as a No. 1 grade. There undoubtedly are methods of doing this but they are probably known only to certain people whose specialty is making sulphonated oils. We have reason to believe that the color of a No. 3 castor oil can be improved by treating it with Fuller's earth. This material has the property of absorbing the organic matter present in the oil, which is responsible to a large extent for the color. Probably a good method of treating the oil with Fuller's earth would be to thoroughly mix the oil with the earth, allowing it to stand a sufficient length of time for the earth to settle out and drag out with it these impurities. Then the oil could be decanted and sulphonation proceeded with.

* * *

Tests for Oils

Technical Editor:

Information on the following questions would be appreciated by the writer:

1. What test do you recommend to find the acidity in olive oil?
2. What test do you recommend to prove the lubricating value of machine oils (other than practical). (5005)

1. For determining the acid in olive oil the following method can be used: 10 grams of oil are weighed in a clean glass beaker, and 10 cc. of neutral alcohol are added with constant stirring. Then 1 to 2 cc. of phenolphthalein indicating solution are added. Standard decinormal solution of caustic potash or soda is then run in slowly from a burette, constantly stirring, until a permanent red color is obtained. As each drop of alkali solution falls into the oil, it produces a pink spot. As long as any acid is in the oil this disappears on stirring. As soon as the acid is neutralized, however, this pink color remains permanent. Each cubic centimeter of alkali solution used is equal to 0.0282 grams of free oleic acid. The result multiplied by ten gives the percentage of the acid in the oil. It is customary in reporting free acid in oils, to report it in terms of oleic acid.

The phenolphthalein test solution can be prepared as follows: 5 grams of phenolphthalein are dissolved in 500 cc. of 50 per cent. alcohol. Since this solution will be slightly acid it must be neutralized by adding 0.01 normal caustic continually until a faint pink color appears. Then just remove the color

(*Continued on page 89.*)

BRILLIANT ACID BLUE 3B

An original wool dyestuff

Most — if not all of the dyestuffs produced in the United States are duplications of products which have already been introduced. Now we have the pleasure of announcing the introduction of an entirely new dyestuff possessing many desirable qualities.

BRILLIANT ACID BLUE 3B is an acid wool dyestuff of great strength. It produces brilliant blue shades of satisfactory fastness to washing and wearing and does not crock. It dyes level and can be used in combination with other acid dyestuffs.

Wool dyers will recognize the advantages of using Brilliant Acid Blue 3B for it places at their disposal a color producing great brilliancy and strength at a reasonable price.

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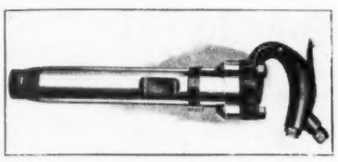
NEW MACHINERY AND PROCESSES

Riveting Hammer

Provides for Low Air Consumption and Easy Operation

The Ingersoll-Rand Co., New York, has developed a new type of pneumatic riveting hammer. The outstanding features include bolted construction for holding the handle to the barrel, heavy section valve with liberal bearing surfaces; combination poppet and piston type throttle valve; power in excess of all ordinary requirements; low air consumption and easy operation. The new style hammers are manufactured in three styles, A, B and C, and are available in a complete range of sizes



Riveter With Outside Trigger Handle

from a 5 in. to a 9 in. stroke. Each size of this riveter can be purchased with any one of three types of barrels and with either outside or inside trigger handles.

The standard "A" type has a barrel machined to accommodate a rivet set clip only and is furnished on all orders which do not specify either a bridge type or retainer type barrel. Three alloy steel bolts of substantial size, fitted with lock washers, hold the handle to the barrel. This enables the riveter to be taken apart anywhere for inspection or cleaning with the aid of only a wrench; no vise or other tools are necessary.

The throttle valve (except on inside trigger handles) is a combination of the piston and poppet types, having the nicety of control of the piston valve and the freedom from leakage of the poppet type. The beveled seat will remain tight throughout the life of the tool, preventing leakage. The throttle lever or trigger is made in one piece from special heat treated spring steel and has a long bearing in the handle, making it capable of withstanding lots of abuse. The control is sensitive, ranging from a light tap to a heavy blow, entirely at the will of the operator.

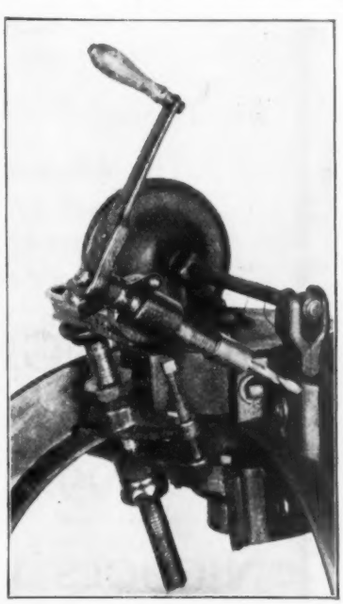
The valve is a sturdy sleeve made from special alloy steel. It has liberal bearing surfaces and its walls are free from holes or ports which so often are the starting points for checks or cracks. It operates in a valve box of strong construction, located in the head of the barrel. The valve box is constructed with a solid end which enables it to be easily taken apart by the use of a piston for the removal of the valve, without recourse to the use of a screwdriver or similar instrument with subsequent danger of injury. This construction also insures a compression chamber in the valve box which cushions the piston on the return stroke and prevents the piston from striking the handle.

The handles are of high quality steel, drop forged to a shape that fits the hand and are sand blast finished to give an excellent grip. Either outside or inside trigger handles can be furnished although the outside type is standard. The exhaust is through the side of the barrel near the handle and can be deflected in any direction desired by the operator, by merely turning the deflector.

Hand Drill

Eliminates the "Unhandy Hole"—Unusual Flexibility

The James Hunter Machine Company, North Adams, Mass., through the demands of necessity in their own plant, have designed a ratchet type of hand drill that has proved to be most efficient and flexible in operation. That others may profit from their experience they are manufacturing these drills for the trade. It is stated that many advantages are afforded by the tool, which can be



Hand Drill of Unusual Flexibility

operated where power drills are impracticable.

The special features of this hand drill include three positive adjustments, drilling at any angle, and clamping to the article to be drilled. It operates readily with but 2 in. of clearance. In places remote from electricity or air, and where a power drill cannot be used, the Hunter ratchet type of drill is said to operate at any angle with ease and accuracy. The same wrench fits all three adjustments. The illustration shows a drill operating at an angle where rigidity and accuracy are required.

It is claimed by the manufacturer that this drill eliminates the "unhandy hole" and further, that it saves many hours for the operator. It drills holes from ¼ in. to 1¼ in.

RECENT TEXTILE PATENTS

Fabrics. Label for wound or rolled. 1,480,307. F. W. Seaton, Lonsdale, R. I.

Heddle frame. 1,480,396. J. Kaufmann, Elkins Park, Pa.

Jute and like fibrous material, Treatment of. 1,480,471. F. D. S. Sandemann, Elkins Park, Pa.

Looms, Oilless bearing for harness rolls for. 1,480,496. J. L. Bobo, Greenville, S. C.

Looms, Warp stop motion for. 1,480,448. P. Keegan, Lowell, Mass.

Printing machine, Fabric. 1,480,348. E. Cadgene and G. Dupont, Paterson, N. J.

Shuttle. 1,480,535. W. J. Gladue, Providence, R. I.

Spinning machines and the like, Weighting device for. 1,480,182. I. C. Noble, New Bedford, Mass.

Stocking or sock top. 1,480,381. C. Feig, Philadelphia, Pa.

Warp drawing machine. 1,479,807. E. F. Hathaway, Dorchester, Mass.

New Publications

Books reviewed in this column may be obtained from Bragdon, Lord & Nagle Co., 334 Fourth Avenue New York City

Cotton in North Brazil, by Arnos S. Pearse, general secretary International Cotton Federation, Manchester, England; 168 pages, illustrated. Price to non-members $5.00.

This volume is a continuation of "Brazilian Cotton," published two years ago as the outcome of the visits of Arno S. Pearse, general secretary of the International Federation of Master Cotton Spinners' and Manufacturers' Associations to that country. In view of the world's shortage of cotton, this book appears at an opportune time and ought to be of general public interest. A preface to "Cotton in North Brazil" has been written by Dr. Miguel Calmon, Minister of Agriculture of the Brazilian Federal Government. The volume deals particularly with cotton conditions in the States of Ceará, Maranhão and Pará, and contains also a synopsis of the cotton potentialities of the whole of Brazil. Many spinners are looking to this country for relief from the cotton famine which is threatening the industry and although labor conditions may not entitle us to expect an immediate increase of millions of bales, yet, with proper organization, especially as regards seed supply, it is anticipated that Brazil may furnish during the next few years a cotton crop of two million bales against her present output of 750,000 bales. The high yield per acre, the low rates of wages and the cheap cost of land are important factors which will contribute toward making cotton one of the principal products of export from Brazil. There is no boll-weevil in the country and the cost of production works out at from 12 to 16c. per lb. against the present price of 35c. of American cotton.

Steam Loss Prevention

(*Continued from page 33*)

were plotted were collected over a period of five years. The chart is useful in detecting errors in accounting and in allocating charges to the power department.

Conclusion

The intrinsic value of this system of conducting a power plant lies in its simplicity and elasticity. While it is being employed in a large steam plant costing one-third of a million dollars annually to operate and furnishing steam and power to a plant covering about thirty acres of floor space, it is equally as practical for use in the small plant.

Such a system is surely worth while, for once the spirit of efficiency and cooperation is imbued into an organization, suggestion on the part of the management and the spirit of contest among the employes will bring about the desired results automatically.

These loss-prevention methods were installed in the plant of the Mount Hope Finishing Company under adverse conditions owing to the erection of a new boiler house, yet operation was not interrupted and efficiency was increased. An outstandng feature was that but one addition was made to the power-plant payroll, namely, the salary of the power despatcher, who was transferred from the engineering department office and has successfully carried on single-handed all the work of his new department.

In view of the fact that the plant was operated at an unusually high efficiency before the new methods were introduced, their value is clearly shown by the additional savings made.

Uxbridge, Mass. During a heavy wind storm on Jan. 16, the roof of the pickerhouse of the Davis & Brown Woolen Co., on Mendon street was ripped off and carried to the roof of the machine shop of the mill adjoining. A new roof is being put on

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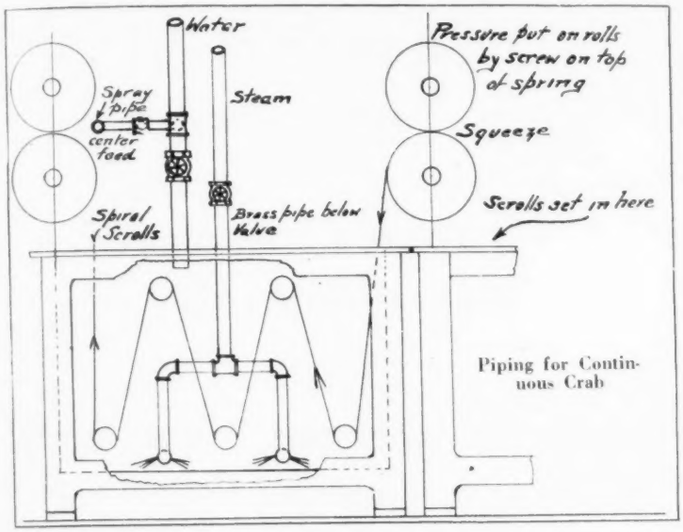
Operating Continuous Crabs

Suggestions on Driving, Covering and Care of Rolls, Water and Steam Piping, and Tension

WHEN a new type of machine is installed in a plant it frequently happens that the best results are not obtained from it for some time. The reason for this is that even the builders do not always know the best method of operation. This knowledge is only acquired by continuous experience in the operation of the unit. Continuous crabbing machines are being used to a larger extent on certain goods and are very efficient. Men who have not operated these machines may find the following of value. The method is suitable for any number of bowls.



Piping for Continuous Crab

The rolls of these machines are usually made of iron but when the machine is kept in constant use no trouble will be experienced from rust. The machine described has seven bowls, six of which are for hot water and one for cold.

The machine is usually belt driven, various speeds being obtainable by step-up cones. The only criticism of this method is that the ratio between the pinion and gear is too close. This gives a low speed for the cone belt which requires to be wide and is not so efficient as a fast running belt. If the gear ratio was such that the pinion shaft could be run at a higher speed, the belt on the step-up cones could be narrower and run at a more efficient speed. The belting cost would also be lower. The power requirements for these machines are low, as a test on a 7 bowl crab with rolls 80-in. face showed 6 H. P. in starting and about 2 to 3 H. P. when running. The power requirements vary depending upon the pressure put on the rolls.

Roll Covering

All bottom rolls should be covered with cheese cloth. This cloth should be 4-in. wider than the roll face so that about 2-in will overhang each end of the roll. Start with 7 layers on the bottom roll in the first box and add one more layer on each roll in the hot water boxes following. The final nip which is on the cold water box should have 4 layers more than the number on the last hot water box roll. On a 7 bowl crab this would be 16 layers on the bottom roll on the cold water box. The same number of layers should be put on the top roll of this box.

The boxes are usually made with cast iron frames and wooden sides, ends and bottom. Drain plugs are put in all boxes but an overflow is only required in the cold water box. Sprays should be put on the nip of all rolls but the cold water spray in the last box is the only one continuously used. Hot and cold water and steam lines should be piped to all boxes. The hot water is also piped to the sprays on the hot water nips. Steam is piped to the cold water box so that it can be boiled out occasionally to remove the scum. The water should be kept boiling, never geysering, and the holes in the perforated steam pipe at the bottom should be drilled so that the steam is diverted downward at an angle of 30 to 40 degrees from the horizontal.

The tension should be kept light on the entering end. Whenever the machine is stopped for the day the top roll should be raised clear of the bottom one. Should the machine be stopped for a few days the top roll should be rubbed with a cloth soaked in kerosene.

The boxes are usually made with two brass carrier rolls at the top and three at the bottom. These rolls can be set over and an additional pair put in each hot water box. This will give the equivalent of two more hot boxes, which will in many cases give better crabbing. The machine should never be stopped while the cloth is running through.

Electric lights are frequently put in on the delivery end behind the folder and the cloth is shown clearly to the operator.

STRIPS
TAPES
STRIP CUTTING
The market for fabrics in strip, rewound into rolls, is steadily increasing and is already of important proportions. Economical production of the strip consumed by manufacturers of bags, flags, clothing, corsets, ribbons, tapes, and so on, demands an efficient slitting and roll-winding machine —CAMACHINE for short.
Textile men who use our CAMACHINE Universal Type 6 declare that it will handle practically every textile roll requirement, eliminating waste of time and material.
If you use fabrics in strip or roll form, or can market your product partially in roll form, let us give you prices and information on the size and type of CAMACHINE best suited to your needs. Complete literature is yours for a postal card; the suggestions you get from it may be worth dollars and cents to you.
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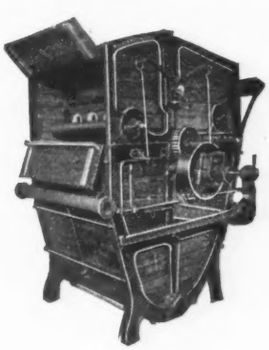

Every type of cotton fabric can be successfully handled in Rodney Hunt Washers. The slack loop method now in use on this machine turns out better-finished fabrics, without straining or overstretching.

Our booklet No. 221 describes our Washers in detail. A postal to us will bring it to you.

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MILL NEWS

NEW MILLS

Cotton

*Burlington, N. C. The annual meeting of stockholders of the Burlington Mills, Inc., was held here last week. J. Spencer Love, secretary and treasurer, gave a report of the progress of the plans and negotiations for the construction of the new plant. J. L. Scott of the board of directors discussed the additional amount of stock which is now being offered for sale for the purpose of adding 100 more looms to the originally planned equipment of the plant. Much of the proposed stock already has been subscribed by the directors and other interested persons.

*Whitnel, N. C. It is expected that the Nelson Cotton Mill now under construction here will be ready for operation by March 1. At a recent meeting of stockholders J. L. Nelson was elected president and treasurer; J. H. Beall, vice-president; J. L. Nelson, Jr., secretary and assistant treasurer.

*Houston, Tex. Chamber of Commerce, C. S. Holland, president, is promoting the organization of a $1,000,000 corporation to build a $750,000 cotton mill, leaving $250,000 for a cash reserve and it is reported that about half the necessary amount has been subscribed.

Wool

Toronto, Ont., Canada. Robert Gaunt of Streetsville, Ont., and others, are interested in the formation of British Woolens, Ltd., for the manufacture of upholstery plushes, woolens, worsteds etc. The plant will be established in Toronto. Construction will begin as soon as weather conditions permit. The matter of machinery is now being looked into. They will buy yarns and their machinery equipment will consist of warping, dyeing and finishing machines.

Knit

Wingham, Ont. This town will vote on a by-law guaranteeing the credit, up to $25,000, of a new woolen mill which will be constructed and operated by J. Matthewman, a former Bradford, England, textile man. Following the passing of the by-law, construction on a modern plant for hosiery and knitted wear will be commenced.

ENLARGEMENTS AND IMPROVEMENTS

Cotton

*Hogansville, Ga. Stark Mills, construction of which was started last summer, are expected to be producing tire fabrics within 60 days. The main building is a three-story reinforced concrete structure, 550 x 130 ft.; picker building, two stories, 90 x 70 ft.; warehouse, 70 x 70 ft.; four stories high; power house, 45 x 45 ft. About 125 houses for operators have also been built. Lockwood, Greene & Co., Atlanta and Boston are the engineers in charge.

*Lawrenceville, Ga. Lawrenceville Mills, a branch of the Barrow County Cotton Mills, Winder, Ga., will equip their recently mentioned addition with 200 looms and it is understood that contract for this machinery has already been awarded. Park A. Dalls of Atlanta is the architect and engineer in charge.

Fall River, Mass. The Durfee Mills has awarded a general contract for the erection of an addition to the boiler house on the west side of Plymouth avenue, to the John Crowe Co., Inc. The new structure will be of steel and brick construction, 50 x 10 ft. 4 inches, and will cost $42,000.

*Webster, Mass. The new oil burning system for the converting mill and office headquarters of S. Slater & Sons, Inc., at East Webster, which has been installed at a cost of about $500,000, to replace coal-burning equipment, was put in operation on Jan. 15. It will be used for both power and heating. The new system can be disconnected and the old coal-burning apparatus put into service in case of emergency within half an hour.

Greensboro, N. C. White Oak Cotton Mills managers are planning to build big additions that will enable the company to provide sufficient spindles to furnish its looms with yarn for full day and night production. They will not undertake this enlargement just now.

Greenville, S. C. The Woodside Cotton Mills Co. has let contract for 50 additional tenant houses. The company recently let contract for 25 houses. It is said that the 75 houses will cost $112,000. An increase in the night force is contemplated.

Wool

Pittsfield, Mass. The Berkshire Woolen Co. plans to convert 125 H. P. available from water at the former mills of the J. L. & T. D. Peck Mfg. Co., on Peck's road, which were acquired last year into electricity and send it back up stream to its own mills. The company is using electrical power in its mills, having a 550 H. P. generator, and can use the additional 125 H. P. for needed purposes. The company is using a part of the old Peck mills for storage and does not need power there.

*Ware, Mass. The new mill of the Ware Woolen Co. on Maple street was dedicated with a dance for employes and their families on the night of Jan. 21. There was dancing from 8 until 12 o'clock to the music of the Amherst College Orchestra. Refreshments were provided by E. J. Gravel.

*Amsterdam, N. Y. Stephen Sanford & Sons, Inc., have completed about 30 houses for operatives and plan to continue their extensive building program, previously outlined.

Knit

Indianapolis, Ind. The Real Silk Hosiery Mills, 624 Noble St., have awarded a general contract to the Ostrom Realty Co., Peoples' Bank Building, for the erection of a two-story and basement addition, 50 x 190 feet, to cost $75,000. Lockwood, Greene & Co., 38 S. Dearborn street, Chicago, are architects and engineers.

*Stillwater, N. Y. The Ballston Knitting Co., whose plant here is now under construction, advises that the new structure will be used as a finishing mill for the Ballston plant. Initial equipment will consist of looping machines, washing machines and drying forms. Electric power will be used exclusively. It is expected to have the plant ready for operation in March, with a force of about 50 operatives.

*Waterford, N. Y. The Ford Manufacturing Co. will start installation of machinery in the new five-story addition during the coming month, according to announcement made last week. About 100 additional workers will be given employment in the annex.

High Point, N. C. The Piedmont Mills Co. which manufactures hosiery from the yarn produced by the Highland Cotton Mills, Inc., is reported to be planning big additions. J. H. Adams is president of both companies.

Silk

*Philadelphia, Pa. G. Josephs' lately established weaving mill at Wayne Ave. and Philadelphia and Reading R. R., has 26 looms producing art silk draperies; 26 more will soon be added.

Miscellaneous

Griffin, Ga. The Lowell Bleachery, South, which completed its plant early last year, is planning the installation of additonal bleaching and finishing machinery for treating textile fabrics other than the turkish towels, terry cloth and crashes which it now handles for the Kincaid Mfg. Co. The latter's entire output is treated by the new bleachery.

Peabody, Mass. Danvers Bleachery & Dye Works have been completely remodelled.

New Cumberland, Pa. The Pennsylvania Dye & Bleach Works, Inc., are considering tentative plans for the construction of a two-story addition.

FIRES

Ballston Spa, N. Y. The Ballston Knitting Co. is temporarily curtailing production due to a fire starting in the carding room of the plant. Much damage was done to the carding machine in which the conflagration originated and the one next to it.

Philadelphia, Pa. The plant of F. H. Berman & Son, 3425 Market St., waste and wiping rags, was seriously damaged by fire on Jan. 18.

Woonsocket, R. I. Fire believed to have started in a picker at the Belmont Woolen Yarn Mills, 34 E. Mill St. on Jan. 16 resulted in damage to the picker room to the extent of about $5,000. The fire broke out again the following day doing about $1,000 additional damage.

FACT AND GOSSIP

Bakersfield, Cal. It is reported that H. S. Matthews of Los Angeles is endeavoring to organize a local company to construct and operate a cotton mill in this section, estimated to cost $175,000.

Danielson, Conn. The plant of the River Weaving Co. is now owned and run by L. Bachmann & Co. W. F. Mulligan is superintendent.

*Putnam, Conn. Receivers for the Manhassett Mfg. Co., makers of tire fabrics, were recently granted permission by Judge L. F. Waldo Marvin of the Superior Court, to sell the physical assets of the company.

*Douglasville, Ga. Negotiations for the purchase of the Lois Cotton Mills, previously reported as conducted by The Farish Co., have just been completed. This mill wil become part of Beaver Mills, a Massachusetts corporation, operating plants at North Adams, Mass., and Waterford, N. Y., which will give the company variety as to product and a unit manufacturing under conditions in the South. The new plant wil be known as the Lois Mill of the Beaver Mills. Its product—staple print cloths—will be sold through The Farish Co., New York. It is contemplated that the new management will take over the operation of the new unit on Feb. 2.

Rome, Ga. J. A. Strain has bought Echota Cotton Mills No. 2 in Rome and will change their name to Strain Cotton Mills. Mr. Strain has been president of Echota Cotton Mills and Calhoun (Ga.) Yarn Mills.

Clinton, Me. The Clinton Woolen Mills, Inc., have been incorporated with capital of $10,000. Frank L. Besse, Clinton, is president and B. F. Beane, treasurer.

Monson, Mass. The A. D. Ellis Mills, Inc., which were incorporated on Dec. 31, with $600,000 capital, have elected the following officers: President and treasurer, Dwight W. Ellis; vice-president and assistant treasurer, George W. Ellis; secretary, Frank J. Entwistle.

Needham Heights, Mass. Mill No. 2 of the Wm. Carter Co., will hereafter manufacture children's underwear exclusively. Men's and women's underwear which has been produced there for a number of years will now be made in the Springfield plant.

Pittsfield, Mass. The Musgrove Knitting Co. has elected officers for 1924, as follows: President and treasurer, Joseph H. Wood; secretary, Charles M. Musgrove; directors, the officers and Perry E. Miller, who is manager and buyer, William S. Noble, William A. Burns, Charles K. Ferry and John H. Musgrove.

Butte, Mont. The Montana Woolen Mills have been incorporated with capital of $250,000 for the manufacture of woolen sweaters and underwear. H. D. Hanson, Tom Davis, G. A. Robe, Victor Buchi and J. J. Caplis, of Butte, are incorporators.

Brooklyn, N. Y. Myles Purvin has been appointed receiver for the Arctic Knitting Mills, Inc.

Kinderhook, N. Y. The Kinderhook

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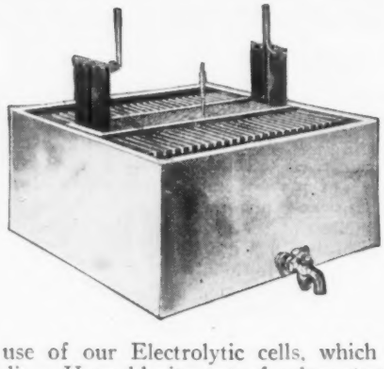

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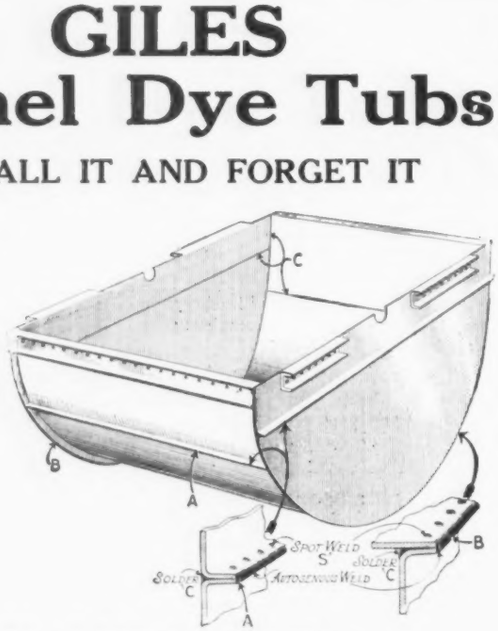

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NORWOOD ENGINEERING COMPANY

FLORENCE, MASS., U. S. A.

Mill News—Continued

Knitting Co. has been dissolved and the business of the company has been taken over by the Kinderhook Knitted Cap Co.

NEWTON, N. C. The court has confirmed the sale of the Newton Asbestos Yarn Mill to Julius W. Abernethy, and a new company, the Fiber Mfg. Co., has been formed to take over and operate the plant. The mill was involved in the failure of the Norweed plants last year. Officers of the Fiber Mfg. Co. are Julius W. Abernethy, president and active manager; S. J. Smyre, vice president, and W. B. Gaither, secretary and treasurer.

RUTHERFORDTON, N. C. The Grace Cotton Mill, fully equipped for the manufacture of fine combed yarn, has been sold to S. B. Tanner and associates, of Rutherfordton and Spindale.

VALDESE, N. C. The Liberty Hosiery Mills have been sold to J. G. Berry.

EASTON, PA. The Haycock-Cronemeyer Co., with plants in Easton, Avoca and Lansdale, Haycock Silk Throwing Co., Easton, Haycock Bros. & Cronemeyer, Easton, and the Avoca Silk Throwing Co., Avoca, have been merged into one company, known as the Haycock-Cronemeyer Co., with capital of $1,000,000. Wm. R. Haycock is president; Benjamin Haycock, Jr., vice-president; John Haycock, treasurer; C. Cronemeyer, secretary and sales manager. Benjamin Haycock, Jr., is buyer for all branches.

LANCASTER, PA. The Fulton Knitting Mills, successors to Duncan & Gustafson, are manufacturing knitted silk ties at R 340 College Ave. Equipment consists of four latch needle knitting machines and six sewing machines. Harry C. Duncan is president and superintendent; E. L. Bear, treasurer.

LINFIELD, PA., the Crescent Underwear Mills, Inc., formerly located at Limerick, Pa., and now in Linfield were purchased recently by Ronald A. Reiff of the Aurora Knitting Mills, Pottstown, Pa., and his associates who are carrying on operations.

PHILADELPHIA, PA. Apaca Knitting Mills, S. E. Cor. Mascher and Turner streets, manufacturers of sweaters, bathing suits and etc., have been granted a Pennsylvania charter of incorporation, with a capital of $75,000. Application was made by Jacob Frostadt, treasurer, and others.

PHILADELPHIA, PA. Richard E. Schletter, Inc., manufacturers of women's full fashioned hosiery, now sell their product through the David Jacobs Corp., 268-4th Ave., New York. Equipment of the plant consists of 33 knitting machines, ten loopers and nine sewing machines.

PHILADELPHIA, PA. The Paragon Knitting Mills, 3907 Powelton Ave., manufacturers of sweater coats, etc., have been granted a charter of incorporation with a capital of $100,000. Nathan Neuman is president of the company and Harry Leidner, secretary-treasurer.

PHILADELPHIA, PA. Application for a charter of incorporation under the laws of Pennsylvania will be made on Jan. 28 for a company to engage in the manufacture of hosiery under the name of the Royersford Hosiery Co. This application will be made by Henry Arronson, attorney, Commercial Trust Bldg., Philadelphia.

PHILADELPHIA, PA. A committee of creditors has been appointed to investigate the financial condition of the Grampian Mills, 2120 W. Allegheny Ave., manufacturers of worsteds, whose liabilities are reported at about $55,000 and assets approximately $33,000. This committee composed of Godon F. Bottomley, Alfred E. Wolstenholme, H. P. Holdsworth, H. St. Clair Wagner and James J. O'Brien, is expected to report shortly what it considers the best way of adjusting the affairs of the company.

PHILADELPHIA, PA., Samuel Kissin and others of the Diamond Towel Mills, N. E. Cor. Hancock and Oxford streets, towels, wash cloths and bath rugs, will make an application for the incorporation of this business in Pennsylvania on Feb. 5, to be known as the Diamond Towel Mills, Inc.

*PHILADELPHIA, PA. The Reliable Knitting Mills, 2433 N. Orianna street, bankrupt, have made application for a discharge. A hearing will be held on Feb. 16, at 10 A. M. at the U. S. District Court in this city.

HAMBURG, PA. The Standard Knitting Mill Co. has purchased the former plant of the Sylva Knitting Co. in Hamburg and plans to operate in the new quarters, in April. The Sylva Company is now located in West Reading.

NEW CASTLE, PA. The Frew Co., carpets, has been incorporated under the laws of Pennsylvania, having a capital of $250,000. J. H. Frew and others made this application.

*NORTH SMITHFIELD, R. I. According to a report, Amedie Provost, wool combers of Roubaix, France, will form a Rhode Island corporation capitalized at $2,300,000, and start construction of the proposed worsted mill in April. This company has options on a 100-acre site near Branch Vilage, North Smithfield and it is expected that negotiation for purchase will be completed within a short time.

PAWTUCKET, R. I. The Dexter Yarn Co., recently reported planning to discontinue the fine cotton spinning branch of their business, will offer at public auction conducted by G. L. & H. J. Gross, Providence, at 10 A. M., Feb. 5, machinery and equipment for the manufacture of cotton yarns from 10s to 40s, combed and carded. The machinery will be sold separately.

PROVIDENCE, R. I. The Rochambeau Worsted Co., King and Dearborn Sts., Olneyville, is now manufacturing merino yarn in all sizes and percentages, with equipment of 6,000 spindles. French system is used. Louis Lepoutre is president, Johnston Mali, treasurer Maurice Jouvenaux, agent.

WOONSOCKET, R. I. The Leicester Knitting Mills Co., has absorbed the Jersey Knitting Co., Springfield, Mass., and it is reported that the Springfield plant will be moved to Woonsocket and consolidated with the Leicester mills which have ample space for the additional machinery.

GREAT FALLS, S. C. The Republic Cotton Mills have bought an additional 128 acres of land adjacent to the mill property.

*Indicates previous mention of project.

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COTTON GOODS MARKETS

Fair Volume on Fall Napped Goods

Prices Unchanged from Last Year's Opening Make Them Especially Attractive

A satisfactory volume of business has been booked on lines of napped goods for fall, opened the latter part of last week by the big company. Prices named on all lines are unchanged from those made a year ago, the entire market of necessity following the lead of the dominant factor in this regard.

The unexpected cheapness of these goods has evidently caused buyers to depart, to some extent, at least, from their ultra-conservative policy on forward commitments, and a number of them are quoted as having already covered approximately 50% of their requirements. There is no great cause for jubilation in this for mills, however, as a comparison of spot cotton prices now and a year ago will quickly show.

"Prices Too Low"

Complaints are general in the competitive market to the effect that the new prices are much too low. It will be remembered, that last year's opening had been expected to be made on a basis at least 1c. higher than that named. This year mills are certain to sell only limited quantities at opening levels, as is attested by the quick withdrawal of several lines of solid color flannels. Several houses announced at the opening that they would sell only a portion of their production at the low quotations made; it is understood that one new line of cheap goods has already been advanced.

Other Goods Shown

Lines of ginghams, blankets and other finished goods have been priced during the week, quotations in most cases not being available for publication. The reduction in staple ginghams last week to 12½c. is understood to have stimulated a fair amount of business on these goods. The market is reported relatively inactive on bleached goods, which is perhaps natural in view of the weakness in gray goods.

Heavy volume on any class of heavy colored goods is not reported in any section of the market, though fair business is claimed to have been received by several. Denims for nearby deliveries are quoted from 25 to 26c. for 2.20s.

Gray Goods Quiet

Under the influence of a weak raw material market business in gray goods has been confined largely to comparatively small orders, and the entire market is quiet, on the whole. Prices have sagged off appreciably in conformity with cotton, business being done at mid week at 10c. for 64x60, 5.35 yd. print cloths in the second hand market.

With the upward movement of cotton on Wednesday many opinions were expressed to the effect that the end of the downward swing has been seen.

Cotton Goods Trade Notes

H. C. Bruner, Jr. has been appointed sales manager of William Simpson Sons & Co. Mr. Bruner has been in the Chicago office of the company for 20 years.

The Amoskeag Mfg. Co., Jarvis, Loomis & Dunbar, selling agents made the following prices last week on napped fabrics, quotations being exactly the same as those announced in January last year:

	Cents
27-Inch Fancies.	
Moleskin	12½
1921 cloth	15½
27-Inch Plains.	
Pamela Cloth	12
Tacuna Cloth	12½
Ponceta Cloth	12½
Trinnada Cloth	13½
Panola Cloth	14½
1921 Cloth	15½
Tunis Cloth	15½
Iris Cloth	15½
Daisy Cloth	17
36-Inch Fancies.	
1101 Cloth	17½
1921 Cloth	20
Teazle Down	22
36-Inch Plains.	
1101 Cloth	17
Panola Cloth (901)	18½
1921 Cloth	19½
Teazle Down	21½
Daisy Cloth	22
32-Inch Shirting Flannel.	
2701 Cloth	22½
2801 Cloth	20

Prices are for bleached and lights.
Darks, 1 cent per yard advance.
Delivery, April to October.
Terms, 2 per cent 10 days, Oct. 1.
Mill delivery no freight allowance.

All other lines of napped goods have been priced the same as last year, following the example of the big company.

The Amoskeag Mfg. Co. last week also announced a reduction in the price of 27 in. staple ginghams to 12½c. the decline being slightly less than 2c. from the last price.

Unbranded bleached goods were sold during the week on a basis of 12¼s. for 64x60s.

U. Morris Shockley, William R. Neff and J. R. MacColl, Jr. were elected vice presidents of Converse & Co. at a recent meeting of the board of directors.

1923 Export Figures

Cotton Goods Shipments Decline 123,198,773 Sq. Yds.

With the announcement by the Department of Commerce of export statistics for December complete comparisons of the year's business with that of 1922 are possible. The decline in total shipments of cotton goods shown by previous monthly reports was continued in December, the figures being 34,824,336 sq. yds., valued at $5,952,883, which compare with 41,098,949 sq. yds., valued at $6,623,634 shipped in December, 1922.

Total exports of all cotton cloths during 1923 were 123,198,773 sq. yds. less than in 1922.

The following comparative figures for the 12-month period will be of interest:

	1922	1923
Raw cotton, including linters, bales	6,113,813	5,279,015
Raw cotton, including linters	$673,249,613	$807,092,390
Cotton manufacturers, total	$138,701,617	$138,010,223
Cotton cloths, total sq. yds.	587,492,532	464,293,759
Cotton cloths, total	$86,232,112	$79,312,802
Cotton duck, sq. yds.	10,939,685	8,929,817
Cotton duck	$4,360,753	$4,064,770
Other cotton cloths—unbleached, sq. yds.	177,172,182	103,286,881
Other cotton cloths—unbleached	$19,296,926	$13,731,328
Bleached, sq. yds.	99,681,739	77,635,357
Bleached	$13,871,473	$12,287,691
Printed, sq. yds.	113,319,448	102,202,243
Printed	$14,802,468	$15,196,072
Piece dyed, sq. yds.	101,467,669	99,577,361
Piece dyed	$18,111,287	$19,679,792
Yarn dyed, sq. yds.	84,911,809	72,662,000
Yarn dyed	$14,789,205	$14,353,149
Cotton yarn, thread, etc. Carded yarn, lbs.	9,641,982	7,327,227
Cotton yarn, thread, etc. Carded	$3,451,516	$3,299,164
Combed yarn, lbs.	5,861,878	4,754,157
Combed yarn	$3,364,148	$3,332,508
Sewing, crochet, darning and embr'y, cotton, lbs.	$1,944,640	$1,809,013
Sewing, crochet, darning and embr'y, cotton	$2,034,732	$2,065,520
Cotton hosiery, doz. pr.	4,792,604	5,159,750
Cotton hosiery	$89,221,834	$10,525,183

ST. JOHN, N. B., CANADA. The Canadian Cottons, Ltd., are now running all their mills on short time schedules of three days a week.

Manchester Market Shows Improvement

Adverse Influences Have Been Discounted—Strike Settlement is Expected Soon

MANCHESTER, ENG., JAN. 23 (*Special cable to* TEXTILE WORLD.)—Prospects in the market tend to improve. It is held that adverse influences have now been fully discounted and more stability in prices is expected. An early settlement of the railway strike is anticipated and the companies are running a fair service. There is little danger of the new labor Government attempting extreme legislation.

Manufacturers of piece goods during the week have sold more freely for China, considerable sales being effected in Bleaching cloths. There is now a tendency for greater activity in gray shirtings, favorable advices being received as to clearances in Shanghai and Hong Kong. Persistent demand noted for India, especially in light goods. Operations for the Near East remain restricted. South American exchange is better and there is more business. Finishing cloths are moving off steadily for European countries.

Definite attempt is to be made to control production of American yarns and the scheme expected to be approved. American yarn quotations are firmer. Not much activity found in Egyptian spinnings. Encouraging sales made in bundle yarns for India.

This weekend it will be possible for the employers to claim a reduction in operatives, wages, but no action is probable just at present.

Index number for the week is 260.

Conn. Mills Changes?

Official confirmation is lacking of the report that R. H. Ballou, formerly vice president of the Manhasset Mfg. Co., Putnam, Conn., will become selling agent of the Connecticut Mills Co., Danielson, Conn., succeeding the R. J. Caldwell Co., New York. Mr. Ballou is reported to be establishing offices in the Rhode Island Hospital Trust Co. Building at Providence. The executors of the estate of the late Tracy Lewis are offering for sale the stock of the estate in the Connecticut Mills Co., estimated to be about one third of the total issue. This matter will be consummated by the end of January, it is understood, and an announcement regarding the selling arrangements, may be expected at that time.

BIDDEFORD, ME. The Pepperell Mfg. Co. is temporarily curtailing operations in the Laconia division. The new schedule of three days a week, affects about 200 weavers.

Comparative Quotations

	Jan. 23, 1924	Jan. 16, 1924	Jan. 25, 1923
Spot Cotton, New York	34.00c.	33.80c.	28.60c.
Print Cloths:			
27 -in., 64x60, 7.60 yd.	7½c.	7⅞c.	8c.
38½-in., 64x60, 5.35 yd.	10¾c.	11c.	11c.
39 -in., 68x72, 4.75 yd.	12c.	12½c.	12c.
30 -in., 72x75, 4.25 yd.	13¼c.	13¾c.	13¼-13½c.
Brown Sheetings:			
36 -in., 56x60, 4 yd.	13c.	13¼c.	12¾c.
36 -in., 48x48, 3 yd.	15½-16c.	16c.	15c.
37 -in., 48x48, 4 yd.	12½c.	12⅝c.	12¼c.
Pajama Checks:			
36½-in., 72x80, 4.70 yd.	13½c.	13¾c.	11¾-12c.
36½-in., 64x60, 5.75 yd.	10¾c.	11¼c.	10½c.
Drills, 37-in., 3 yd.	16-16¼c.	16c.	15¾c.
Denims, 2.20c. (indigo)	*26c.	*27½c.	23-24c.
Tickings, 8-oz.	30c.	30c.	30c.
Standard Prints	10¾c.	10¾c.	11c.
Staple Ginghams, 27 in.	12½c.	—	—

*Nominal.

AMERICAN·WOOLEN·COMPANY
TRADE MARK REGISTERED U.S. PAT. OFFICE

Dependable

By the dependable quality of its woolen and worsted fabrics and its prompt service and supply, the American Woolen Company has won the confidence of Manufacturers of clothing and of the public who wear them.

American Woolen Company
Wm M Wood, President

Selling Agency
American Woolen Company of New York
18th to 19th Street on Fourth Avenue
New York City

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CARDS and SHEETS
PRESS BOARDS
GLAZED OR HARD-ROLLED

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Mills: Windsor, Conn.

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TALBOT MILLS
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Broadcloths Velours
Selling Agents
PARKER, WILDER & CO.
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Dunn Worsted Mills
WOONSOCKET, R. I.
Fancy Worsteds

Piece Dyes
BATTEY, TkULL & CO.
Selling Agents
New York Office, 257 Fourth Ave.

J. P. STEVENS & CO.
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Finance Account of Manufacturers and Merchants
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NEW YORK
Established over 80 years

WOOL GOODS MARKETS

Variety Keynote of Women's Fabrics

Chance for Women to Evade Charge of Being "Uniformed"

The women's wear trade continues to put its hope in variety for both the coming spring season and the more distant fall. A number of garment designers have taken very seriously the charge that American women are "uniformed," and their attempts during the last six months to get away from concentration on limited lines to the production of widely differing garments which may be adapted to the taste and personal appearance of the individual, are now bearing fruit. The sports idea has proved helpful in making color one of the features of current fabrics, and the consumer can now find a fashionable shade in almost any color which she may consider becoming, instead of being limited to browns, or grays, navy or black. Fabric weaves have gone into almost the same sort of broad development, and fine twills and tweeds, shaggy fabrics and velvety effects, all have their place in the market. It is of course up to the consumer to pick out the combinations best suited to her, and if that is done there need be no fear that American women will be "uniformed" this season.

Expect Leader to Develop

The mere presentation of an all-inclusive variety is not going to diversify the dress of women unless they themselves cooperate and buy with that in mind. The trade is of the opinion that the coming spring season will not be so far away from past seasons in that some one or two fabrics will stage a great run at the last minute. There is no indication at present just what these popular leaders are to be and for that reason buyers are moving slowly at present. They are fairly well covered on a general line and prefer to wait for last minute information before they go further. It may not be that the consumers' tastes will be thoroughly tried out until after the spring showings in March.

Hair Line Stripes for Suits

Hair line stripes are reported in the ascendency for use in women's spring suits. At least one prominent source of supply has received an excellent business on these numbers and others are feeling the effect of buyers shopping about for more. The fabrics most likely to make volume sales in the suiting field are said to be woolens of the tweed variety which combine harmonious mixture of pattern and color with a certain rough-and-readiness which suggests sport wear more than do the sleeker worsteds. The woolens also are the fabrics which can be made to meet a price and which will fit most easily into the popular price ranges at which the greatest volume of business may be done.

Women's Wear Trade Notes

The possibility of a reaction in favor of pile-sheen goods is being seriously considered in the women's wear trade. The fact that many of them have been sacrificed this season means that unusually good value in durability has reached the consumer at moderate prices which may prejudice her in favor of pile-sheen goods for the next fall season.

The possibility of large use of pencil stripe goods for suits in interesting the large producers of staples.

Raw Wool Forces Bradford Advance

Topmakers Fear That Higher Costs Cannot be Passed on —Unemployment is Less

BRADFORD, ENG., JAN. 23 (*Special Cable to* TEXTILE WORLD.)—Bradford market is dominated by what is taking place at various wool sales. At Liverpool last Thursday and Friday whole of Bawra offerings of crossbreds were cleared at 15 to 20% advance on December rates in London. This caused another protective advance in quotations for tops and yarns at Bradford, but users held off further business until London sales opened. Yesterday again there was brisk general demand for wool with merinos 5 to 7½% above December, fine crossbreds 10%, medium and coarse crossbreds 10 to 15%.

America competed for very best crossbreds and paid up to Liverpool rates for them, but medium and coarse crossbred wools, though fully up to Hull level, did not reach extreme Liverpool rates. This advance was much too rapid to be convenient from Bradford manufacturers' point of view, and there is no prospect of passing it on to later stages of production in near future. There is, however, expanding output of crossbred yarns both for home and export trade.

Sixty-fours tops are now quoted as high as 70d, but 69d. is about average. Prices on 56s crossbred average 47d., some makers asking 50d. as protective price. Forty-sixes carded are very firm at 25½d. Two-ply 48s botany yarn is very firm at 7s.

Percentage of unemployment in woolen and worsted industry in December was 9.9%, showing slight improvement on previous four months.

Foresee Season's Start Next Week

Slight Delay in Men's Wear Has Brought Beneficial Change in Sentiment

Expectations are running high that next week will see the first showing of wool goods for the fall season on the part of the industry's largest factor. Already the men's wear opening has been delayed beyond the time which was last month generally believed would be reserved for the offering. The feeling has since been gaining ground that buyers would receive the new season's start in no too friendly a mood, and advantages seemed all on the side of giving the buyer a greater opportunity to become hungry for goods. It was also noted, as reported in this column at the time, that clothiers were to send their men to the retail trade again in January and the response given them was to become the basis of clothiers' activity for the two coming seasons. The clothier has been given the opportunity to get this information and digest it through the delay of the men's wear openings. Primary sellers believe that the reaction has been all in their favor, and that the spirit among cutters is now much brighter than it was at the close of the old year. The placing of more spring business by retailers is only one of the factors which are said to make a clothier look with greater enthusiasm upon the fabric market.

Drive on $35 Suits

It is understood from many quarters that one of the country's leading clothiers is going to make a special drive on $35 suits for next fall. At the same time in the clothing field itself it is said that many houses are going to prepare for greater business along the popular priced lines than in the higher quality field. This fact, at a time when an advance is necessary to the cloth market, is taken to mean that the clothier will work within a rather narrow limit on the goods which he will make his feature and on which real volume business may be expected. At present it appears that woolens will be the center of attraction and that the mill which gets out good styles at low figures is assured of a prompt initial business.

Guessing at Advance

The matter of price advance for the new fall season is still being guessed at, and in some quarters of the field guessers are raising their figures. Some in the trade expect to see many worsteds raised 15% while woolens may be from 5 to 10% up. Close figures are likely on overcoatings for in many instances the good reception of overcoatings is counted upon to raise the enthusiasm of the buying fraternity as a whole to a point where excess enthusiasm will spill over and bring about a generous support to the fall wool goods offering as a whole.

MEN'S WEAR OPEN JANUARY 31

The American Woolen Co., will open wool goods in the following departments on Thursday, Jan. 31:

Department 1, Divisions A and B.
Department 3, Divisions A and C.
Department 7, overcoatings and wool suitings.
Department 8, wool uniform cloth.

This means that practically all their lines of men's wear, woolen suitings and overcoatings, also staple worsteds will be opened at that time, while the women's wear lines, and fancy worsteds will be opened later.

Men's Wear Trade Notes

R. T. Francis, Bulkly-Torney Dept., have been appointed selling agents for the knitted fabrics produced by the Broadalbin (N. Y.) Knitting Mills for boys' and children's wear.

Ardsley Textile Co., selling agents, have moved to new quarters on the seventh floor of 257 Fourth avenue.

Dunmore Worsted Co., Inc., and Namquit Worsted Co., Inc., have moved to new quarters on the seventh floor of 257 Fourth avenue.

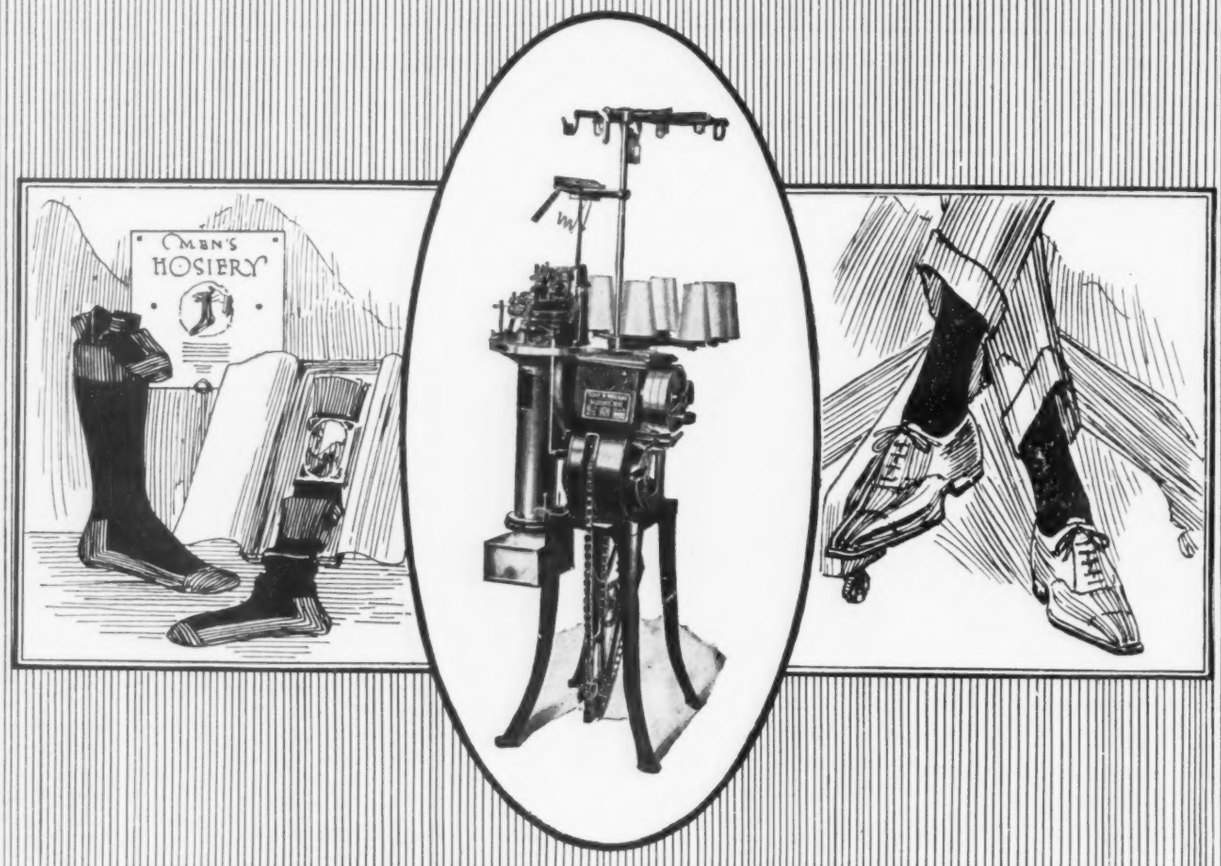
Cambridge Worsted Mills will move on Feb. 1 to new quarters in Rooms 1708 and 1709, 25 Madison avenue.

Govt. Repays Stoehr & Co.

It is announced that the U. S. Government has paid Max W. Stoehr, president of Stoehr & Sons, Inc., a subsidiary of the Botany Worsted Mills, Passaic, N. J., the sum of $1,218,000. This sum represents repayment by the Alien Property Custodian of the sum paid by Mr. Stoehr for 6,000 shares of the Botany stock. The payment is the result of a decision by the United States Circuit Court of Appeals rendered last December that Stoehr & Co. were not alien owned and should not have been seized by the Alien Property Custodian in 1918.

Designers Exhibit

The International Association of Clothing Designers held its convention and exhibition of men's garment models at the Hotel McAlpin, New York, at the close of last week. Comment was made by men's wear factors on evidences of the English influence toward conservative models.



MODEL H-H

Producing Ribbed Top Half Hose Complete

ESTABLISHED 1865

SCOTT & WILLIAMS

INCORPORATED

366 Broadway, New York

KNIT GOODS MARKETS

Hosiery Business is Still Disappointing

Reports of Price Shading on Staples—1924 Should Be Big Year for Silks

Quiet continues to rule in practically all branches of the primary hosiery market. Expectations of a considerable revival in business this month have not been realized, and many in the selling market are again plunged into the depths of a typical New York gloom. Instead of the general advance on cotton hosiery which it was felt certain would be put into effect before this time, it is unquestioned that prices are being shaded here and there in the effort to force business.

Most jobbers have come to the market and gone away leaving behind them only a scattering of fill-in business on staples. Not one bit impressed by the talk of higher prices soon to be made, they picked up their favorite newspaper daily while in New York and watched prices on raw cotton sink gradually lower day by day.

The Jobber's Attitude

It was, of course, unfortuante that this should have happened, but it is likely that jobbers' policy would have been the same had cotton remained steady. Except for those who needed merchandise urgently for the next month or so their attitude has been to sit tight with what goods they have, talk lower prices as energetically as possible, and pay more, if necessary, when they need more merchandise in late February, March or April.

If there is an effective answer a salesman can give to undermine such a policy it has not yet been brought forth for the admiration of a large body of men willing to listen.

Chiffons an Established Vogue

Chiffons have started off the year with a bang. Dissatisfaction may still be felt by some manufacturers of sheer goods selling to the jobbing trade, but it is not to be doubted that most desirable merchandise of this class, as well as that sold direct to the retail trade, has enjoyed good demand recently. Further improvement is predicted by selling agents handling representative lines.

It has every appearance of being probably the biggest silk hosiery in the history of the business, despite the fact that right now there unquestionably are weak spots in the market. "Silk" is used here as inclusive of all thread and fibre mixtures. Wool stockings have made little further headway against the vogue for chiffons.

High colors have established themselves as the big sellers, at least so far as city trade is concerned. The popular shades cover a wide range, principally semi-nudes.

Hosiery Trade Notes

Rumor has it that a line of mercerized stockings, ribbed to the toe, is being offered at $3.62½.

This is the character of merchandise which achieved a decided success when first brought out last year. Lines first in the field were originally priced at $4.50, and later advanced to $4.75.

Varying reports are heard regarding the reception given a new line of eight strand full fashioned silks quoted at approximately $10.50.

Fancy top novelty ribbed goods for misses and children continue a market leader. Some mills are working 24 hours a day on these goods, with recently increased production well sold ahead.

The low in official quotations on 176 needle half hose, transferred top, continues at $1.10 net.

We are informed that the managing director of one of the largest British hosiery companies is arriving in this country on or about January 25. Interested firms may obtain his New York address by applying to the New York District office of the Bureau of Foreign and Domestic Commerce, 734 Custom House.

There was a slight accession in the hosiery and knit goods trade in Great Britain just prior to the Christmas season, but no general improvement has taken place in the condition of the industry, according to a report from Consul S. T. Lee at Nottingham.

According to some British trade papers the most serious contributory cause is the decline in the orders for silk hose, which is attributed to the competition from the United States.

It is claimed that enormous quantities of American silk hosiery are being imported into England at prices with which the British manufacturers cannot hope to compete, and that whereas a year or so ago over 20,000 dozen pairs were turned out in a week it is doubtful whether one-eighth of that amount is being manufactured at the present time.

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*Hamburg, Pa. S. D. Bausher & Son, who have recently completed an addition to their dyeing plant, making the present building 440 x 80 ft., have increased their capital from $200,000 to $400,000. They do commercial bleaching and dyeing of knitted cloth, hosiery, cotton and silks; dyeing of yarns and silk, also bleaching of yarns.

Technical Service to Knitters

National Association Arranges to Solve Finishing Problems

Through an arrangement with the American Laundry Machine Co., Cincinnati, O., the National Association of Hosiery and Underwear Manufacturers is enabled to offer to its members a rather unique service—technical consultation at the mill with regard to machinery troubles.

Although this form of service has been in operation for some time as a part of the machine company's specialty department, it is only recently that it has been extended to members of the hosiery association.

Briefly, the service consists of technical advice to manufacturers of hosiery and underwear with regard to their finishing machinery troubles. The American company maintains a staff of highly trained men capable of analyzing knitting mill finishing problems pertaining to hosiery dyeing and finishing, underwear finishing and treating, shrinking and setting the cloth prior to the cutting operation. Through arrangement with the association these men will call on any member mill anywhere to work out with the management the selection of proper machinery, layout of hosiery dye houses and finishing departments for knit goods, and also solve problems pertaining to hydro extracting and centrifugal work.

The National Association is handling the correspondence between members and the machine company entailed by this service, which is being conducted entirely without obligation to members of the association.

Accuse N. Y. Labor Dept.

Albany, N. Y.—The Associated Industries, composed of many textile manufacturers, has sent a petition to Governor Smith demanding an investigation of the State Department of Labor. Among the manufacturers on the board of directors of the organization are John A. Perkins, agent of the Harmony Mills, C. C. Washburn, general manager of the Van Brocklin & Stever Co., Amsterdam, and Camuel Rothschild, president of the Superior Silk Mills, Gloversville. Eight charges are made against the department by the organization. The petition states that there has been a serious breakdown in the Department of Labor, particularly in the administration of the workmen's compensation act.

Chattanooga, Tenn. The Nicholson Hosiery Mills of Chattanooga will be merged with the Dalton (Ga.) Hosiery Mills and the machinery removed to Dalton. Fred Nicholson will be superintendent of the plant.

New Volume Small on Fall Underwear

Jobbers Place Light Business on Men's Standard Ribs—Pessimism Unwarranted

Expectations have been realized in men's standard heavyweight ribbed cotton underwear for fall. Volume business has not yet developed from jobbers, and selling agents seem to have resigned themselves to the fact that it is likely to come gradually.

The official opening last week on the product of up-State mills can hardly be called a failure, however. Business has seeped in from smaller operators in the form of comparatively small lot-orders, and immediate acceptance of the new price ranges was not expected from large jobbers. As the sales manager for a large New York State mill expressed it this week: "We are content with the way things are developing, and I am serious in making this statement. We have enough business on our books, principally on lightweights, to enable us to run full until April, and we do not want the rush on heavyweights that we experienced last year.

Rush Not Wanted?

"If new business keeps coming in at the present rate," he continued, "we will be entirely satisfied. I am confident that by this time next month we will have sold practically every account on our books, not in the same quantity as initial business last year, of course.

"To the best of my knowledge I am in my right mind, and I predict that heavyweight prices will be higher, not lower, before many months. Speaking entirely for my own mill, we do not want to fill up our production at present prices, which are cheap, no matter what the jobber may think—or, rather, say."

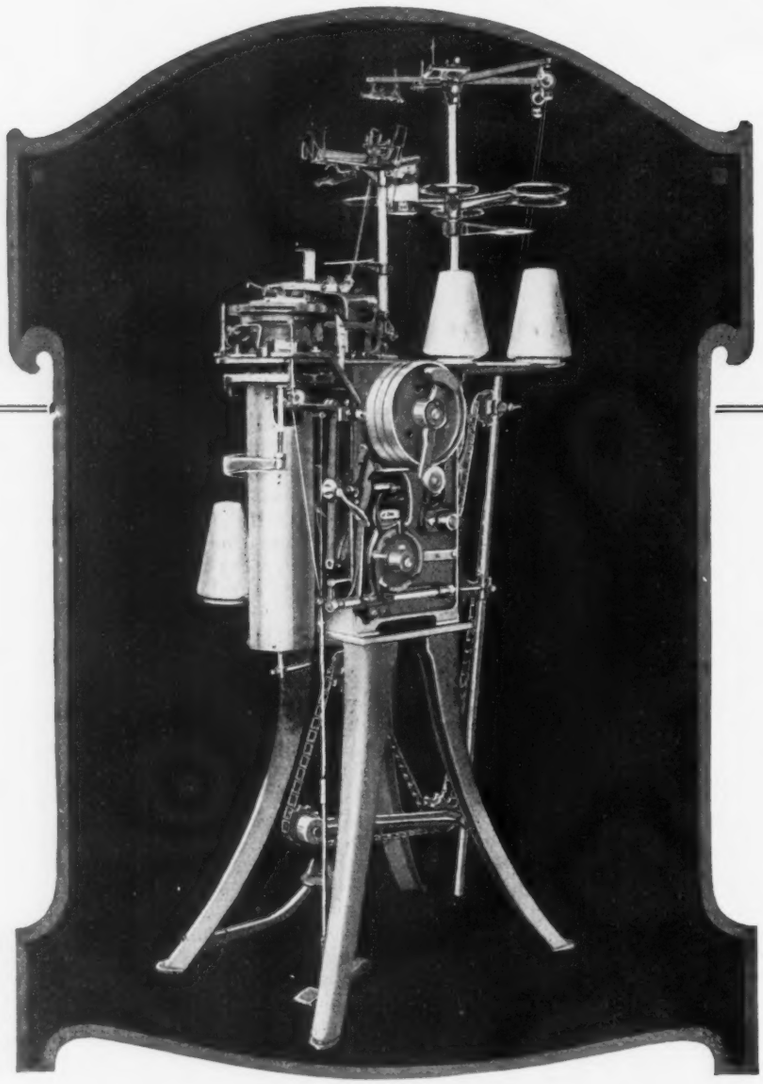
Break Not Expected

Much the same attitude is expressed in other sections of the market, though often not so vigorously. If there is to be any attempt, organized or unorganized, to break the market for standard goods sold to jobbers, it does not seem likely to succeed, at the moment of writing.

It is unfortunate that cotton should have weakened as it did during the jobbers' visit to the market, adding strength to their understandable desire not to buy immediately at the advances, but this weakening does not alter the opinion of most competent observers that cotton will be higher in the long future.

Price cutting at this time would seem to be a ridiculous procedure.

Slow development of business on



Wildman Spring Needle Knitter

We have grown to be proud of the successful performance of Wildman Spring Needle Knitters under the exacting duties imposed upon them by the necessities of modern production.

You can increase the quality of your hosiery and still maintain the high production with Wildman Knitters.

We are now able to sell Wildman Spring Needle Knitters in all foreign countries.

On request we will send the Wildman Spring Needle Knitter Machine Instruction Book, giving detailed information and description of every important part of the machine.

We have issued a very complete and informative book "The Science of Knitting."
Price $3.00

TRADE MFG MARK

WILDMAN MFG. CO.
NORRISTOWN, PA.

Knit Goods Markets—Continued

men's standard ribbed goods to date calls attention to the fact that business booked prior to official openings by New York State mills was probably larger than has been realized.

Pre-Opening Volume

Everyone was aware, of course, of the big volume done by southern mills on sub-standard goods; there was no secret about it.

But the volume taken on western quality products was probably larger than generally realized, and also there was probably a good basis for the whispers heard regarding quiet business taken on standard goods at "inside" prices. Favorite large-jobber customers are in all probability better covered on men's heavyweights than appears on the surface.

Underwear Trade Notes

Operating against the placing of heavy initial business on men's standard ribs are a number of influences, not the least of which is the price comparisons jobbers are able to make with other lines.

Ginghams, flannels and other staple piece goods lines, which loom up most important in the jobber's mind because of their dominating volume, are quoted at about the same prices as a year ago. Cotton hosiery can be bought at very little advance; staple sweaters have been purchased at the same or only slightly higher prices than those of a year ago.

It is a natural reaction for the jobber to say, "Underwear 20 to 30% up? Well, let's wait awhile." This sentiment will undoubtedly be heard later on from retailers when the jobber goes on the road with his lines, and it is this which the latter apparently fears most.

So far operations of larger jobbers on standard goods at opening prices have admittedly been confined largely to sufficient business to cover them with samples.

A comparison made in the local office of one well established line of goods shows that business for fall thus far is exactly on a par with that done during an equal period in the season of 1922.

An optimistic note is expressed by the man in charge of sales for a branded line of standard goods. "Did any mill possessing good common sense expect a rush of initial business at these prices?" he rises to ask. Answering his own question he continued: "If one large jobber walked in this office and placed his season's business with us now I would take the first train back to the mill and go over my cost figures again."

A number of important buyers have returned to their homes, and salesmen for most lines have gone out after them.

Outerwear Quiet; Routine Business

Question Popularity of Jumper and Oriental Type Sweaters for Women

It is a routine market in knitted outerwear distributed through the jobbing trade. Fairly steady business, usually for comparatively small quantities, is reported by the larger commission houses, but sizable individual orders are a rarity.

Volume is well in on cheaper lines of men's staple sweaters throughout the market, but no one makes a secret of the fact that considerable business is still to be placed on merchandise over $30 per dozen. General expectations are that this business will dribble in during the next few months, and few expect any sudden rush from the jobbing trade.

What will be good for spring still remains an open question. The women's novelty sweater business has developed so radically along style lines that jobbers are handling this character of merchandise more gingerly all the time. Reports continue to conflict regarding the operations of retailers in their purchases of spring goods from wholesalers.

A man of long experience in selling women's sweaters to the jobbing trade stated his opinion this week to the effect that neither the jumper nor the oriental type would make much headway this spring with his ultimate outlet, which might be classed as small-town stores. He believes that for this class of retailer the fancy front golf sweater, sleeveless and with sleeves, will be the dominant note for spring and summer this year, as it was last.

New Printing Method

(*Continued from page 37*)

form of globules. The fibres and fibre particles were attenuated, having a worn away appearance at the ends.

No chemical tests gave results other than would have been obtained from cellulose. Boiled in water the pellets did not soften sufficiently to be flattened under a spatula, but they took dye rapidly after having been boiled for some time, which the unboiled pellets did not.

Condition of Use

The rope drive was in a room with a clean dry atmosphere which might vary in temperature between 55° and 68° F. during the year, so that there was no apparent reason for the defect. But this was the third time a similar thing had occurred on this drive.

Examination of the drive suggested that the acute bending round the small guide pulleys might cause internal friction. From the large driv-

"PARAMOUNT METHOD" FABRIC HOLDER

The PARAMOUNT Fabric Holder is one of the greatest developments in the art of finishing hosiery. It prevents the goods from creeping up during the drying process and the following advantages are all direct results of its use:

Uniformity of length.
No disfigurement of goods.
Less work for pairers.
Goods lie better in boxes.
Improved finish of the product.

PARAMOUNT FORMS and METHOD OF FINISHING have been developed to meet every requirement of correct finishing.

With PARAMOUNT EQUIPMENT you are assured of an increased selling value in your merchandise, greater production and fewer seconds. You will find a large saving in labor, steam and floor space, improved factory conditions and satisfied help. If interested, our representative will call, DEMONSTRATING IN YOUR OWN MILL WITH YOUR OWN PRODUCT the improved results obtained by finishing on Paramount Drying and Shaping Forms.

You can secure Paramount Equipment on either a Sales or Rental basis.

Complete equipment can be seen in New York Office, 366 Broadway.

Address all correspondence to Chicago Office.

Paramount Service Goes With All Paramount Products

PARAMOUNT TEXTILE MACHINERY CO.

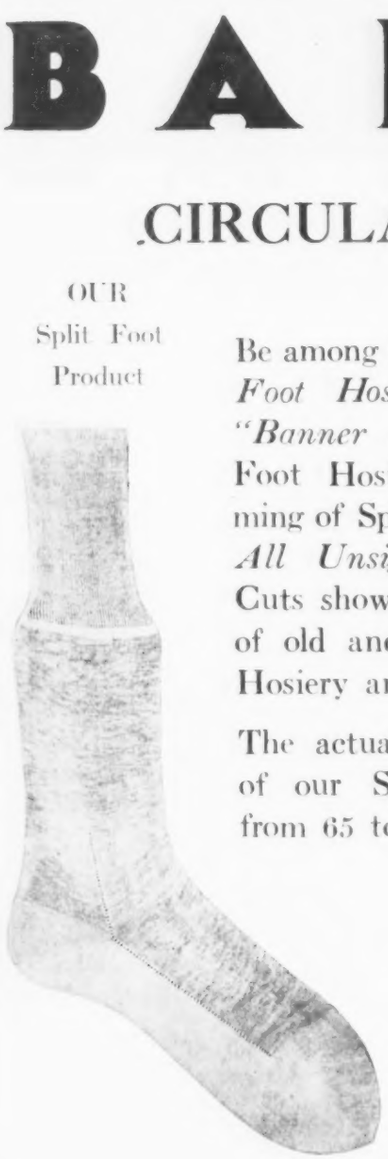
Hunter Building

Market and Madison Streets, Chicago, Ill.

BANNER

CIRCULAR KNIT HOSIERY

OUR
Split Foot
Product



Be among the *Leaders* by making *"Split-Foot Hose* and *Half Hose"*, on the *"Banner Split-Foot Machines"*. Split-Foot Hosiery does away with the trimming of Splicing Yarns and is *Free From All Unsightly Ragged Edges.* The Cuts shown herein are actual photographs of old and new types of Circular Knit Hosiery and are shown inside out.

The actual saving of silk in the product of our Split-Foot machine, will range from 65 to 85 cents per dozen pairs.

WE INVITE INQUIRIES

Usual
Product

HEMPHILL COMPANY

Main Office and Factory
PAWTUCKET, RHODE ISLAND

Southern Office
James Building
Chattanooga, Tenn.

New York Sales and Show Room
350 BROADWAY, NEW YORK

Philadelphia Office
Colonial Trust Bldg.
Philadelphia, Pa.

ing pulley (*a*) in the accompanying illustration, the rope passed over a small guide pulley (*b*) to the large driven machine pulley (*c*) and back to (*a*) over a second small guide pulley (*d*), (*c*) running at right angles to (*a*), (*b*) and (*d*).

The rope travelled over (*a*) say from east to west, (*a*) revolving in the reverse direction to the hands of a clock, then under (*b*), which revolved in the direction of the hands of a clock. Then it passed at right angles, or say north to south over (*c*), then again east and west under (*d*), both (*c*) and (*d*) running in reverse direction so that if the material in the centre of the rope were plastic, there were all the conditions for forming it into balls. First there would be the degradation of the fibre, down to an impalpable powder, in all probability accompanied with rise of temperature. At the same time kneading under pressure would be going on, while the twisting of the rope in turning at right angles during its course would determine the shape of the pellets.

A variety of stain with which most piece dyers are acquainted sometimes arises when cloth is bleached in the rope form. This stain—which does not show before dyeing—is known as the "rubbed" or "friction stain" by those who know the cause, but by others is named anything from "feather stains" to that all-embracing and convenient word "oxycellulose."

Though the cause of these stains is known, it is difficult to say just where the damage is done. Those formed when the cloth is in motion may often be traced home, but those caused or formed when the cloth is apparently in a state of rest are more difficult to trace. These stains once formed, even if only of a moderate density, cannot be removed without altering the nature of the fabric. If very deep, dyeing in dark shades only accentuates them. A padded aniline black does not always cover them, although they do not show after finishing. In sulphur black they dye up bronzy and finishing does not hide them.

The best way to get rid of the goods is to send them out white, if possible, and even then it is not safe to tint (blue) them on a jig. The fact that the stains are irremovable, even by reboiling in the kier, suggests that the fibre has been altered in some way. This brings such stains into line with the instance of the defective rope.

Friction and Pressure

It has been further proved that if a piece of wet calico be stretched out smoothly on a glass plate and, with a fair amount of pressure, the smooth rounded end of a glass rod be drawn over it, the marks will be clearly seen when the cloth is subsequently dyed with a vat, sulphur or direct color, the marks being not so pronounced with mordant and basic colors.

As friction combined with pressure gives these undesirable results when applied fortuitously, it seemed probable that this combination, if under control, might be of utility, and the outcome of the experiments made was the invention and patenting of a new method for ornamenting cotton and other fabrics.

The effects are different from those obtained by any other method of calico printing, appearing more like woven than printed effects. The same imposed pattern has a different appearance for every different make of cloth to which it is applied—say sateen, cambric, matting or velvet.

The process may be applied to the cloth either before or after bleaching, as bleaching does not remove it. There need be no drying of the goods from the time they are first wetted, until the dyeing is completed, which means a great saving in fuel in the case of heavy goods. The process may be carred on in any ordinary piece dyehouse, as well as in a calico printworks. The process now awaits commercial exploitation.

Dec. Cotton Spindles

WASHINGTON, D. C., Jan. 21, 1924. —The Department of Commerce announces that according to preliminary figures 37,535,709 cotton spinning spindles were in place in the United States on Dec. 31, 1923, of which 34,044,870 were operated at some time during the month, compared with 34,101,452 for Nov., 34,378,662 for Oct., 33,929,885 for Sept., 33,708,667 for Aug., 34,237,887 for July 34,843,421 for June, 1923, and 34,976,103 for Dec., 1922. Detailed figures for Dec. follows:

State	Spinning Spindles (in thousands) In place Dec. 31	Active during December	Active Spindles Hours for Dec. Total	Average per spindle in place.
U. S.	37,635	34,044	7,139,371,847	190
Cotton-growing	16,747	16,254	4,067,109,546	243
New England	18,862	16,080	2,759,447,516	146
All Other	2,026	1,710	312,814,785	154
Ala.	1,320	1,267	296,565,357	225
Conn.	1,710	1,225	254,701,422	149
Ga.	2,706	2,600	698,046,745	258
Me.	1,142	1,081	181,931,119	159
Mass.	11,952	9,945	1,642,010,547	137
N. H.	1,448	1,023	158,091,125	109
N. J.	446	424	74,984,520	168
N. Y.	1,041	871	159,702,228	153
N. C.	5,672	5,522	1,361,447,200	240
Penn.	204	151	26,856,845	131
R. I.	2,862	2,661	519,720,057	182
S. C.	5,173	5,088	1,378,626,919	266
Tenn.	456	447	105,465,078	231
Va.	691	666	113,544,881	164
All Other	1,194	1,067	235,735,156	197

Cotton Stocks Dec. 31

The Merchants National Bank of Boston computes the total stocks of cotton in the United States at the end of December as about 6,541,000 bales, against 7,633,000 bales last year and an average of 10,179,000 in the last four years. Spinners' stocks were 1,623,000 bales this year, against 1,917,000 last year and an average of 1,685,000 in the past four years. Stocks in public and private storage, on plantations and in transit were 4,918,000 bales this year, against 5,716,000 last year and an average of 8,494,000 in years.

Canadian Wool Up 10%

The Canadian Co-operative Wool Growers, Limited, Bay Street, Toronto, report the sale of 50,000 pounds of Ontario and Canadian west grown wool during the second week in January at 10% advance in price over the sales of similar grades in December.

JACOB K. ALTEMUS

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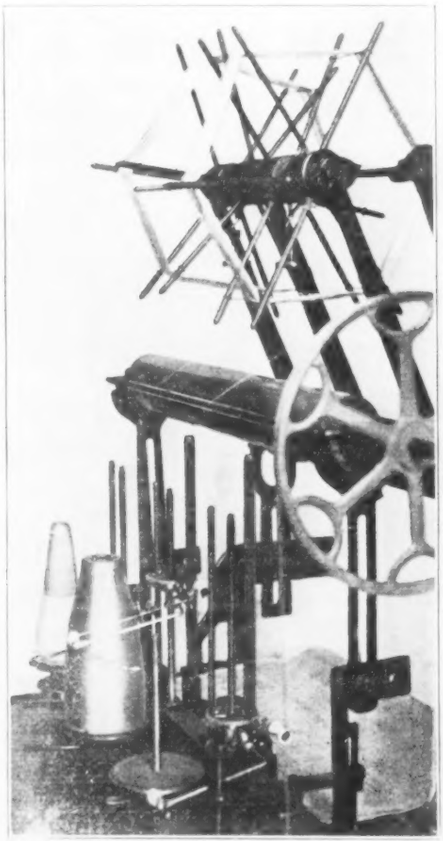

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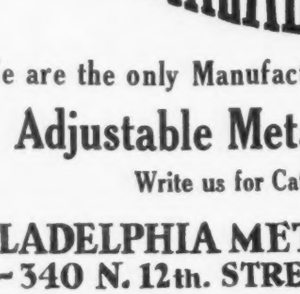

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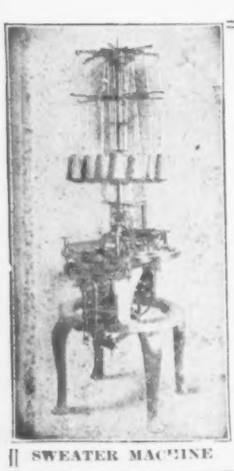

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Sweater and Toque Machinery

We announce to the knit goods trade that both our new Latch Needle Sweater and Toque Machines, after severe and protracted tests, have proven unqualified successes.

Sweater machines knit plain, half, and full cardigan, stripe, rack and have separating course.

Toque machines automatically stripe three colors on ribbed fabrics.

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for trimming knit underwear

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SILK GOODS MARKETS

Broadsilks Hold Last Month's Gains

Price Situation More Satisfactory —Dress Season Slow in Getting Started

The broadsilk market held its gains made during the past month with business reported in most quarters as active. The improvement has been felt in practically all quarters with no particular class of merchandise singled out as unusually good unless it can be said that the satin Cantons and satin crepes are a bit ahead of the procession as a whole. Retailers are taking goods for spring in a larger way with many buyers in the market just now.

The cutting up trades while buying more actively than for awhile past are not at the moment the factor that they should be. In fact it is pretty well known that business with them has so far not come up to expectations. Although things should have opened up with a rush during the first part of the current month, it must be recorded that as far as can be ascertained their season was nearly two weeks late in getting under way. In other words during what should be the height of the busy season whole organizations waited around hopefully but helplessly for the buyers to come in. Business lost at this time is difficult to regain and the dress trades are resigned now for the most part to a spring season somewhat below normal. Other lines such as millinery, underwear, and blouse trades report about the same situation, that is, business about 10 days to two weeks slow in getting under way.

On the other hand it must not be concluded that this is definitely lost to the silk trade for increased sales at retail may compensate for such losses. It may simply mean that the trend is away from the made up merchandise and that women are buying cut lengths at retail and making things up themselves.

Style Indications Indefinite

Style indications are still very indefinite. Most retail buyers in a position to feel the pulse of the buying public believe that the prints will be good throughout the spring without question. There is a wide difference of opinion as to just what type prints will be wanted but that the prints are wanted is agreed. As to the satin materials, quite a number believe that despite the recent activity in satin Cantons, the dull crepes will be the leaders this spring with the satins held over for the fall.

Paterson, N. J. N. Ullman & Co., formerly manufacturing broad silks at 220 Van Houten St. and 220 Straight St., are out of business.

Raw Silk Higher

Advance in Exchange Stiffens Prices

A sudden advance in Yen exchange rather than an increase in demand on the part of manufacturers caused a stiffening in quotations in the local market. In the first part of the week the strength in exchange nominally put prices about 50 cents a pound higher but during all the time it was not difficult to find spot parcels in the hands of both importers and resellers considerably below parities based on prices abroad and the current exchange.

Several days saw a wide variation in quoted prices with a difference in some cases ranging up to 50 cents a pound. On Thursday for instance one house was quoting $8.45 for XXA which could be procured from other sources at close to $8.00. Those who had silk were quite willing to take a nominal profit. The case with which silk could be bought below the market did not instill a great amount of confidence in manufacturers who bought sparingly at the advance. The result was a quiet week with business somewhat below the past several weeks in point of volume though prices were slightly higher at the close. Prices are as follows:

Japan Filature Double Extra A	13/15	$8.05
Japan Filature Double Extra B	13/15	8.00
Japan Filature Extra Best	13/15	7.95
Japan Filature Extra	13/15	7.90
Japan Filature Best No. 1X	13/15	7.85
Japan Filature Best No. 1	13/15	7.82½
Canton Filature New Style	14/16	7.55
Canton Filature New Style	20/22	7.25

Up-Town Silk Men Elect

Members of the Up-town Group of Textile Credit Men met in the rooms of the Silk Association Saturday and elected the following officers: Chairman, Sidney Blumenthal of Sidney Blumenthal & Co., Inc.; vice-chairmon, E. Irving Hanson of H. R. Mallinson & Co., Inc.; secretary, Ramsay Peugnet Secretary of the Silk Association of America; treasurer, Samuel Eiseman of Samuel Eiseman & Co., Inc. Prospects for membership were suggested, and by-laws were presented for discussion.

Boston, Mass. During the month of November, last, the American Woolen Co., paid out the sum of $26,400 in death benefit insurance to employes. This brings the total payment for such insurance since June, 1919, to $1,018,050. For accident and health insurance during November, the payments amounted to $30,647.40, making the total since the start of such insurance $1,770,165.75.

SILK SITUATION AT A GLANCE

PRODUCTION	Unchanged at about 50 to 60 per cent.
DEMAND	Gains noted in December being held.
STOCKS (BROADSILKS)	Not unusually large.
RAW SILKS	Stocks unchanged; Prices slightly higher.
SENTIMENT	Manufacturers expect moderately active season.

SUMMARY OF SILK CABLES

The Yokohama market has been extremely quiet throughout the whole of the past week. Sales in the open market have been negligible although on the Bourse there were several days of active trading with transactions running close to 500 bales. The undertone has been weak. A sharp rally in Yen exchange concurrent with the widespread reports that negotiations for a Japanese loan in this country were soon to be concluded made prices very much higher in dollar terms. Exchange from a low of close to 43.00 for sight advanced as high as 46.50, which would make a difference of about 7% or 50 cents a pound in prices. The fact, however, that many dealers had silk to sell with no desire for unusually large profits made for cheap offers in New York. Later reelers conceded a decline of 30 Yen, bringing XXA back to 2180 Yen and Kansai No. 1 to 2130 Yen, which did not result in any interest on the part of exporters. The Bourse has fluctuated with the exchange. While the advance was in progress, the Bourse was very weak, May dropping to 2145 as against 2200 at the close of the past week. With an easing tendency in exchange, however, the Bourse has regained some of its loss with the May delivery rallying to 2170. The Canton market has been quiet with prices rather easy in view of the reportsizable stocks.

Good Advance Buying Noted in Ribbons

Retailers Operating More Actively for Spring—Millinery Trade is Interested

The week has registered additional improvement in ribbons. Buyers are in town in considerable numbers from the Middle West and Pacific coast, with the latter section well represented and apparently optimistic as to prospects for spring. Interest as usual seems to center on the narrows, although the wides are wanted for certain purposes. Novelties of all kinds are wanted, particularly those which contain a metallic thread in various combinations.

The millinery trade has been taking goods in fairly large quantities and it is expected as the season advances that a better call for wide ribbons will come from this source. On the other hand the cutting up trades report that business has not come up to expectations with the retailers conservative in their operations for spring in the made up garments. Demand from this source has consequently been less active than hoped for.

The plain moires and gros grains have been moving better than expected and some of the newer ideas in Bayadere stripes have likewise been well received. As to colors along with the staple blacks and navies there seems to be a call for brighter effects.

Textile Course

The spring session of the course of the Manufacture and Finishing of Cotton Goods, conducted by Columbia University, New York, at Room 306, Engineering Building, will commence on Feb. 8. Classes will be held each Friday from 7:30 to 9:20 P. M. The course is offered particularly for those engaged in the cotton textile trade and is planned so that the lay person may follow readily. The scope includes growing of cotton fibre; preparatory processes; further manufacturing processes; cloth construction; finishing of cotton fibre, yarns and cloths; standard market fabrics; comparison and analysis of many kinds of cotton goods; cost and production calculations. Enrollment is at the office of the Registrar, Room 315, University Hall. The instructor is James W. Cox, Jr., consulting textile engineer and cloth specialist, of New York.

Lynchburg, Va. The Lynchburg branch of the Consolidated Textile Corp. has cut operation to four days a week. It is expected that the curtailment will be only temporary and that full production will be resumed by Feb. 1.

WHETHER for standard garter top hosiery or for fine gauge chiffon hosiery "Reading" Machines will enable you to attain the highest degree of perfection.

And this is another reason why, today, "Reading" Full-Fashioned Hosiery Machines are used by fully ninety per cent of all full-fashioned hosiery manufacturers in the United States.

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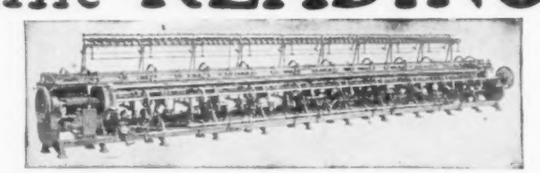

FULL-FASHIONED HOSIERY MACHINE

FINANCIAL MARKETS

Improved Demand For Textile Stocks

Both Listed and Unlisted Shares Attracting Increased Attention —Little Change in Prices

BOSTON, Jan. 23.—There has been a further increase in investment demand for a wide variety of listed and unlisted textile securities thus indicating that regular investors consider that current values, as well as the business outlook, render a large proportion of such securities attractive. Buying is of a discriminating character, but is far from being confined to the gilt-edge class of stocks, or those that have maintained their price position during the slump of the last six months. Some of the most active buying, in fact, is of stocks that have suffered declines ranging all the way from 25 to 50 points, but that are believed to represent bargains of the most attractive character at present selling prices. If for no other reason than that business has been so poor during the last few months, a very decided improvement is looked for during the next few months by most shrewd operators.

Among the most active of the unlisted stocks are Arlington and Nashua common; following report of the excellent showing made by the former company several good sized lots of stock have been picked up within a range of 100 to 101, a block of 100 shares being sold at today's auctions at 100¾ or an advance of ⅞ point from the last public sale. Nashua common continues its upward movement, with sales today at 85⅛, or an advance of 3⅝ points. Hamilton cotton is another stock that is attracting attention because of its abnormally low price, sales today at 47¾ representing an advance of ⅞ point. With the exception of a sale of Lyman Mills at 161, or a decline of 2 points, all of the other sales at today's auctions involved only fractional price changes. Prices of shares listed on the local exchange show little change, with the exception of Amoskeag common that has declined 3¾ points to 78¼ after selling during the week as high as 82, and American Woolen common that has declined a point to 75⅝ after a selling at a high for the week of 77¼.

Sharp Preferred Dividend Passed

There is nothing surprising to those well acquainted with the effect of the long-continued depression in the combed cotton yarn market and the difficulty that most mills of this character are having in their attempt to trade a new dollar for an old one, in the news that the Sharp Mfg. Co., New Bedford, has decided to pass its preferred dividend. There is $1,161,000 preferred and $2,696,000 common, and the dividend on the latter was passed in August of last year. The preferred is a 6% stock, entitled to receive up to 8% at the directors' discretion. Dividends have been regularly paid on the preferred since 1910 at the 6% rate, and from 1917 to 1922 inclusive at the rate of 8%. Last year the company reverted to the 6% basis. Last fall the directors, at the recommendation of Treasurer Arthur R. Sharp, decided to put in about 1,000 looms for the utilization of a considerable proportion of the company's combed yarns on fine count goods, and these looms are now being installed. If this venture is successful it is probable that enough looms will be installed to take care of the product of at least half of the company's 200,000 spindles, and this diversified character of production should make the company just that much more independent of the vagaries and fluctuations of the combed yarn market.

Arlington Mills Good Showing

Although the Arlington Mills statement for the fiscal year ended Dec. 31 last has not yet been published it is understood that it was one of the best in its history, with net profits of about $3,000,000 after all charges. Only in 1917 and 1919, when the final balance was about $3,600,000, has this record been improved upon. In fact, last year's earnings will be about as large as the combined net of the year's 1921 and 1922, which aggregated a little over $3,000,000. The turn-over last year is said to have aggregated about $23,000,000, as compared with $13,500,000 in 1922. Last year's earnings were about $25 a share for the $12,000,000 of capital stock, as compared with $12.75 in 1922 and $12.64 in 1921.

Connecticut Mills Affairs

Judge Daniel Burke, executor of the estate of the late Tracy S. Lewis, former head of the Connecticut Mills Co., tire cloths, Danielson, Conn., is reported to be inviting offers for 21,840 shares of Class A common stock of the company, bids to be closed January 30. There are 61,250 shares of the Class A common, and 9,050 shares of Class B common, both having a par value of $10. The remaining capitalization consists of $1,420,000 first preferred, and $1,065,000 second preferred, each of $100 par value. No dividends have been paid on the second preferred since Jan. 3, 1921, and since April 4, 1922, as a result of failure of directors to declare and pay four consecutive quarterly dividends, the affairs of this company have been in the hands of the preferred stockholders. As a result of their management a bank and merchandise debt of $8,000,000 was paid off in less than a year and without the aid of new financing. Dividends on the 1st preferred have been resumed, and it is stated that the company now has over $1,500,000 of net quick assets. All that the common stockholders need to do now to regain control of the company would be to pay off $12.25 of back dividends due on the first preferred stock. One of the largest common stockholders, outside of the Lewis estate, is the R. J. Caldwell Company, of New York City, the selling agents for the mills. The company's plants are located at Danielson, Conn., Fall River, and East Taunton, Mass., and are said to be operating at the present time at about 60% of capacity.

Boston Stock Auctions

The following sales of textile shares were made at today's auctions:

Shrs.	Mill	Par	Price	Change
10	Lyman	100	161	— 2
1	Ludlow	100	147½	— ⅝
3	Great Falls	100	35½	— ⅝
45	Nashua, pfd.	100	100	....
3	Otis	100	119¼	— ⅛
59	Plymouth Cordage	100	106	— 1
25	B. B. & R. Knight pfd.	100	32	+ 1⅜
1	Nashua, com.	100	85⅛	+ 4
100	Arlington	100	100¾	+ ⅞
3	Hamilton Mfg.	100	47⅜	+ ⅞
12	American Felt pfd.	100	105	+ ⅞
262	Total			

Stocks Are Quiet

Mills at Newberry an Exception —Interest in P. & N. Ry.

SPARTANBURG, S. C.—There has been little interest in common stocks of southern cotton mills during the past week according to A. M. Law & Co. Quotations in most cases have changed very little. A few stocks, such as Victor-Monaghan Co. common and Anderson Cotton Mills common have declined from one to two points. There has been little trading in other stocks with a few exceptions.

Brogon has been quite active with quotations standing now at two points higher and few offerings. Also, Newberry, Mollohon, and Oakland, the three leading mills of Newberry, have been in excellent demand, especially Newberry, which has advanced three points, with the bid standing higher now than in the last 10 months, and no offerings of the stock at all. This activity is due principally to the increase in the dividend rate from 8% to 10%.

While not a textile stock, yet as the Piedmont & Northern Railway serves a good many cotton mills, and its prosperity is dependent to considerable extent upon the business given the company by adjoining cotton mills, there has been much interest in its common stock, which has advanced during the last six months from $12 per share to $25. The earnings for last year will amount to approximately $7 per share on the common after paying all fixed charges. The road is controlled by the Duke interests, also owning the Southern Power Co.

Stocks Continue Recession

GASTONIA, N. C.—The average price of 25 cotton mill stocks as released by R. S. Dickson & Co. of this city and Greenville, S. C., stands at 135.40 for this week against 136.00 for last week, a recession of 60 points. The South Carolina stocks Musgrove, Poinsett, Saxon, Spartan and Watts 1st are off $1 per share; Pacolet common and preferred, $2; Victor-Monaghan, $3; Limestone, $4; and Anderson, $6; while Riverside and Dan River showed a loss of $15 in bid price. The Clifton, Glenwood, Judson, Monarch, Newberry, Orr and Victor-Monaghan preferred showed a slight rise in bid prices. On the other hand the North Carolina stocks showed a rising tendency, Acme, Clara, Dixon, Durham Hosiery preferred, Mansfield and Roanoke 2nd preferred showed a rise of a few points. Trading in common stocks remained quiet during the week, only a few small lots changing hands. The preferred stock market continued active, large blocks of Smyre preferred being taken up during the week. The price of this stock being advanced to $102.00 and interest per share on Jan. 16.

New England Textile Stocks

(Quotations based upon last sales at Boston public auction and Boston Stock Exchange.)

	Latest Sales.	Previous Sales.
American Woolen, pfd.	102¼	100¾
Amoskeag, com.	78¼	79¼
Androscoggin	142½	145
Appleton	720	760
Arlington	100⅜	99⅞
Bates	236¼	235¼
Bigelow-Hartford, pfd.	114¼	114¼
Boott	135½	....
Edwards	115	110
Esmond, pfd.	93½	101
Everett	170½	180
Farr Alpaca	210	198
Great Falls	35½	36¼
Hamilton Woolen	96½	95½
Hamilton Mfg.	47⅜	46½
Hill	150⅞	149
N. E. Southern, pfd.	53	52
Ipswich, com.	40	42
Lawrence	71¾	82
Ludlow Association	147½	148½
Lyman	161	163
Massachusetts	143⅛	149
Merrimack	100⅛	99⅝
Nashua, com.	85⅛	81½
Naumkeag, New	166⅝	164¼
Newmarket	140	135
Pacific	86	86
Plymouth Cordage	106	107
Tremont & Suffolk	101½	100
York	123	125¼

Miscellaneous Stocks

(Reported by M. H. Wildes & Co., Inc., 30 State Street, Boston, Mass.)

	Bid.	Asked.
Arlington Mills	97	100
Bates Mfg. Co.	....	230
Bigelow-Hartford Carpet Co., com.	....	150
Brookside Mills	....	175
Columbus Mfg. Co.	140	....
Dwight Mfg. Co.	75	78
Edwards Mfg. Co.	....	100
Everett Mills	150	155
Farr Alpaca Co.	195	200
Gluck Mills	120	125

ALLEN PROCESS SOCKETS
LOOK FOR THE CORNER TRIANGLES
TRADE MARK

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It is worth what it otherwise costs to deal with the breakage of cheaper screws. It is worth what you're spread in production-losses. It is worth what you save in mechanics' time—say 60c. per hour; an hour's time per broken set screw.

It's too big a saving for any *price*-difference to equal. Get the prices, but also the facts on *values*, in the Allen booklet.

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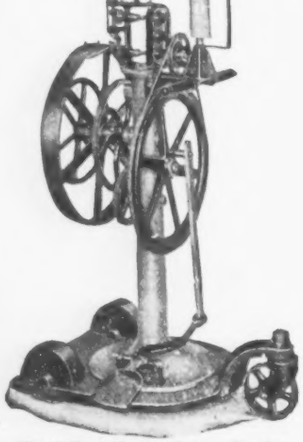

No. 9 Foot Fower Rotary Sewing Machine

An Exceptionally Efficient Machine

This Portable Foot Power Sewing Machine has earned itself a reputation for economy in hundreds of mills. Gear driven, it is easy to operate and capable of attaining a high rate of speed. It is used in various parts of the mill, principally in the dyehouse, bleachery and print room, for sewing Woolen, Cotton, Burlap and other fabrics of all weights, wet or dry. Sewing Head operates without arm or connection. Write for details.

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ESTABLISHED 1888
GREENVILLE, S. C.
SOUTHERN TEXTILE STOCKS
We have had extensive experience in locating sites for new textile developments, and offer our services in this line.

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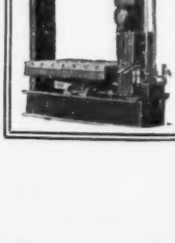

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Financial Markets — Continued

Great Falls Mfg. Co.	36	38
Hamilton Mfg. Co.	46	48
Hamilton Woolen Co.	95	99
Lancaster Mills, com.	120	125
Lancaster Mills, pfd.	100	103
Lawrence Mfg. Co.	70	75
Lowell Bleachery	123	127
Ludlow Mfg. Associates	140	142
Lyman Mills	....	170
Massachusetts Cotton Mills	140	....
Merrimack Mfg. Co., com.	100	105
Merrimack Mfg. Co., pfd.	82	85
Nashua Mfg. Co., com.	81	85
Nashua Mfg. Co., pfd.	98	100
Naumkeag Steam Cotton Co.	175	178
Otis Co.	130	136
Pepperell Mfg. Co.	139	142
Plymouth Cordage Co.	106	108
Tremont & Suffolk Mills	100	105
Waltham Bleachery & Dye Works	....	125
Warwick Mills	....	100
West Point Mfg. Co.	130	135
York Mfg. Co.	113	116

N. Carolina Textile Stocks

(Taken from list of Southern Mill Stocks quoted by R. S. Dickson & Co., Gastonia, N. C., and Greenville, S. C.)

	Bid	Asked
Acme Spinning Co.	111	115
Am. Yarn & Processing Co.	110	116
Am. Yarn & Processing Co, 8% pfd.	104	107
Arlington Cotton Mills	120	121
Arrow Mills	99	106
Cabarrus Cotton Mills	165	175
Cabarrus Cotton Mills, pfd.	104	107
Cannon Mfg. Co. (par $10)	16¼	17
Chadwick-Hoskins Co. (par $25)	18	22
Chadwick-Hoskins Co., 8% pfd.	104	107
China Grove Cotton Mills	102	104
Clara Mfg. Co.	100	106
Climax Spinning Co.	165	176
Clover Mills	97	101
Crescent Spinning Co.	112	116
Dixon Mills	116	121
Durham Hosiery, 7% pfd.	54	57
Durham Hosiery, "B"	8	9
Eagle Yarn Mills	85	87
Eastern Mfg. Co.	90	95
Efird Mfg. Co.	147	151
Erwin Cotton Mills Co.	140	156
Erwin Cotton Mills Co., 6% pfd.	103	104
Flint Mfg. Co.	144	146
Gibson Mfg. Co.	125	....
Globe Yarn Mills (N. C.)	60	65
Gray Mfg. Co.	120	121
Hanes, P. H. Knitting Co.	10½	12
Hanes, P. H., Ktg. Co., 7% pfd.	104	106
Henrietta, 7% pfd.	100	100
Imperial Yarn Mills	145	148
Jennings Cotton Mills	260	276
Linford Mills	97	100
Locke Cotton Mills Co.	105	....
Lola Mfg. Co.	90	97
Majestic Mfg. Co.	176	....
Mansfield Mills	174	180
Mooresville Cotton Mills	109	116
Myers Mill	65	71
National Yarn Mill	140	151
Parkdale Mills	109	121
Perfection Spinning Co.	96	100
Priscilla Spinning Co.	52	61
Ranlo Mfg. Co.	119	122
Rex Spinning Co.	54	65
Rex Spinning Co., 7% pfd.	60	65
Rhyne-Houser Mfg. Co.	92	96
Roanoke Mills, 7% 1st pfd.	102	105
Roanoke Mills, 8% 2d pfd.	98	100
Rosemary, 7½% pfd.	99	101
Rowan Cotton Mills Co.	99	101
Seminole Cotton Mills Co.	101	106
Sterling Spinning Co.	124	....
Stowe Spinning Co.	92	94½
Victory Yarn Mills Co.	85	90
Victory, 8% pfd.	101	103
Winget Yarn Mills Co.	75	82
Wiscasset Mills Co.	146	200

Fall River Mill Stocks

(Quotations furnished by G. M. Haffards & Co.)

	Bid.	Asked.
American Linen Co.	....	70
Arkwright Mills	....	....
Barnard Mfg. Co.	103	107
Border City Mfg. Co.	103	....
Borden Mfg. Co., Richard	120	....
Bourne Mills Co.	140	....
Chace Mills	....	15
Charlton Mills	....	126
Cornell Mills	....	....
Davol Mills	105	....
Davis Mills	102	....
Flint Mills	....	150
Granite Mills	80	95

Dividend Notice

PACIFIC MILLS

A quarterly dividend of one dollar and fifty cents ($1.50) per share has been declared payable February 1, 1924 at The New England Trust Company, Transfer Agents, 135 Devonshire Street, Boston, to stockholders of record January 23, 1924.

Boston, January 21, 1924.

Edwin Farnham Greene, Treasurer.

New Bedford Quotations

(Quotations furnished by Sanford & Kelley.)

	Bid.	Asked.
Acushnet Mills	112½	....
Beacon Mfg. Co., pfd.	100	....
Booth Mfg. Co., com.	....	170
Booth Mfg. Co., pfd.	113	....
Bristol Mfg. Co.	....	190
Butler Mfg. Co.	125	....
City Mfg. Co.	130	....
Dartmouth Mfg. Co., com.	145	150
Dartmouth Mfg. Co., pfd.	84	....
Fairhaven Mills, pfd.	63½	....
Fairhaven Mills, com.	....	80
Gosnold Mfg. Co., com.	120	....
Gosnold Mfg. Co., pfd.	90	95
Grinnell Mfg. Co.	130	....
Hathaway Mfg. Co.	150	....
Holmes Mfg. Co., com.	....	260
Holmes Mfg. Co., pfd.	113	....
Kilburn Mill	157½	162½
Manomet Mills	....	58
Nashawena Mills	109	111
Neild Mills	240	....
N. B. Cotton Mills	105	....
N. B. Cotton Mills, pfd.	99	....
Nonquitt Spinning Co.	73½	....
Pierce Mills	....	500
Potomska Mills	105	....
Quissett Mills, com.	180	190
Quissett Mills, pfd.	100	....
Sharp Mfg. Co., com.	....	60
Sharp Mfg. Co., pfd.	....	72½
Soule Mills	185	195
Taber Mills	....	115
Wansutta Mills	97	99
Whitman Mills	145	152½

Southern Mill Stocks

(Quotations furnished by A. M. Law & Co. Inc., Spartanburg, S. C.)

	Bid.	Asked.
Abbeville Cotton Mills	107	....
American Spinning Co.	280	301
Anderson Cotton Mills	112	115
Aragon Mills	175	....
Arcade Cotton Mills	97	101
Arcadia Mills	280	300
Arkwright Mills	136	....
Augusta Factory, Ga.	62	....
Avondale Mills, Ala.	700	1000
Banna Mills	50	....
Beaumont Mfg. Co.	400	....
Belton Cotton Mills	84	....
Belton Cotton Mills, pfd.	94	96
Bibb Mfg. Co.	190	200
Brandon Mills, pfd.	99	....
Brogon Mills	117	120
Calhoun Mills	140	....
Chesnee Mills	150	180
Chiquola Mfg. Co.	290	300
Chiquola Mfg. Co., pfd.	94	96
Clifton Mfg. Co.	145	150
Clinton Cotton Mills	250	....
Columbus Mfg. Co., Ga.	145	150
Cowpens Mills	91	93
D. E. Converse Co.	132	135
Dallas Mfg. Co., Ala.	170	200
Darlington Mfg. Co.	90	95
Drayton Mills	100	....
Dunean Mills	127	129
Dunean Mills, pfd.	99	100
Eagle & Phenix Mills, Ga.	175	....
Enterprise Mfg. Co., Ga.	95	....
Gaffney Mfg. Co.	100	102
Gainesville Cotton Mills, Ga.	175	180
Glenwood Mills	165	170
Gluck Mills	130	132
Graniteville Mfg. Co.	175	....
Greenwood Cotton Mills	400	....
Grendel Mills	250	....
Grendel Mills, pfd. (par, $50)	48	49
Hamrick Mills	145	155
Hartsville Cotton Mills	185	....
Inman Mills	155	....
Inman Mills, pfd.	100	....
Jackson Mills	275	....
Judson Mills	174	177
Judson Mills, pfd.	102	103½
King, John P., Mfg. Co., Ga.	175	190
Laurens Cotton Mills	151	....
Limestone Cotton Mills	150	154
Marion Mfg. Co., N. C.	125	136
Marlboro Mills	77	79
Mills Mill	285	300
Mollohon Mfg. Co.	126	130
Monarch Mills	140	143
King Phillip Mills	....	172
Laurel Lake Mills, com.	....	40
Lincoln Mfg. Co.	....	....
Merchants Mfg. Co.	125	....
Mechanics Mills	....	93
Narragansett Mills	....	130
Osborn Mills	....	....
Parker Mills, com.	25	40
Parker Mills, pfd.	....	85
Pilgrim Mills, com.	....	....
Pilgrim Mills, pfd.	105	....
Pocasset Mfg. Co.	....	65
Sagamore Mfg. Co.	290	303
Seaconnet Mills	....	....
Shove Mills	....	80
Stafford Mills	....	95
Stevens Mfg. Co.	....	120
Tecumseh Mills	170	....
Troy C. & W. Manuf'g	....	....
Wampanoag Mills	....	96
Weetamoe Mills	....	87

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The reason that these regulators are so small, compact and accurate is because we use, as our expansion member, the marvelous Sylphon Bellows. This bellows is drawn from a flat sheet of metal — **without seams, without solder,** and is so sensitive to variations in temperature that it guarantees your having the temperature always at the degree you require. And since the bellows so absolutely operates the instrument, no auxiliary valves, electric currents, air lines, water lines or drips are necessary; the whole instrument is self-contained—complete as you see it here. Let's get off a copy of this *free* book to your Engineer today.

New No. 934 Sylphon Temperature Regulator.

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THE FULTON COMPANY

KNOXVILLE, TENNESSEE

New York Chicago Detroit Boston Philadelphia

Representatives in All Principal Cities

Temperature Regulators for Control of Liquids or Air

(Continued on page 85)

ESTABLISHED 1892

Schell, Longstreth & Co.

230-2 Chestnut St.
Philadelphia, Pa.

Carded and Combed

COTTON YARNS

All Numbers and
Descriptions for

Knitting and Weaving

Boston Cleveland New York
Utica Reading

An Achievement in Cotton Yarns

Product of

Arlington Cotton Mills

This plant spins fine combed yarns in sizes ranging from 50s to 70s, single and ply, suitable for knitting, weaving, lace and converting purposes. The choice long staple white cotton used produces a yarn noted for its strength, evenness and workable qualities.

Quotations and samples promptly submitted

H. A. FLORSHEIM, *General Sales Mgr.*
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GRAY MFG. CO.
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Johnston Standards~

demand cotton of the proper grade and staple, the most improved machinery and trained and careful workmanship. ¶ These standards are a guarantee of finished yarns—an assurance of the highest quality in knitted and woven fabrics.

Your inquiries and requests for samples will be given prompt attention

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"Direct to Consumer"
Knitting and Weaving ~ Mercerized and Natural
COTTON YARNS
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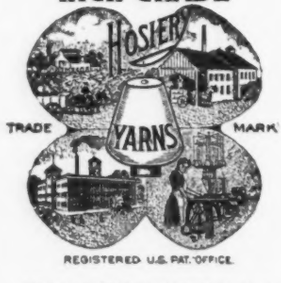

MILLS: BURLINGTON, N.C.

Mutual Building, Richmond, Va.
Range: 14/1-24/1

King yarns have the qualities which appeal to particular knitters. Southern Good Middling is spun by tape-driven spindles into yarn of uniform strength and elasticity. Shall we send samples for tests?

Sold Direct

RUSSELL YARNS

26s—28s—30s
BY SPECIAL PROCESS FROM SELECTED COTTON

Are Particularly and Especially

BUILT TO KNIT

Direct from Spinner to Knitter

The Russell Manufacturing Company
Alexander City, Alabama

Philadelphia Sales Office, 437 Chestnut Street

COTTON YARN MARKETS

Cotton Yarn Buying Still at Minimum

Manufacturers Resell Below Market But at a Profit—Prices What Can Be Had

NEW YORK.—Comparatively little business is being done and buyers apparently are not anxious to operate, even though it is admitted that they can secure concessions on openly quoted prices. The consumer is seeing just how low the market will go and he evidently is finding some who are willing to grant very favorable concessions. This fact, however, is not conducive to buying, for as soon as a price is made below the nominal level it is used as an argument with some other seller to secure an even lower quotation.

It would seem likely that there are those in the selling market who are willing to operate on the short end, for prices which have been reported lately are decidedly below anything that the spinner will quote. In spite of this fact, however, the spread between spinners' and dealers' quotations is small.

Reselling by Consumers

One of the unsettling factors in the current situation is the apparent desire on the part of consumers who own yarn at a low price to resell it below the market but still at a figure that nets them a very substantial profit. It would seem as though the margin thus obtained was more substantial than though the yarn were made up into goods. Not only is there an absence of profit in processing yarn in the majority of instances, but in too many cases there is decided inability to market the resultant product.

As an illustration of the above, the erratic course of the market on 20s-2 warps is noticeable. Notwithstanding the fact that spinners are asking anywhere from 52½ to 54c., brokers have been offering this count as low as 50c. and it is stated that even lower figures might be obtained. The report is that the manufacturer who is the owner of the yarn bought 100,000 lbs. several months ago at 43c. and as soon as invoices are received, he lets out the amount involved on the invoice with instructions to get the most favorable price possible. As long as this yarn is in the process of distribution, just so long is the market on 20s-2 likely to be unsettled. The spread between 20s and 30s-2 is not as great as it was at times last year when on account of the increased use of 30s, the difference between the two counts was as much as 10c. a lb. Today it is

(Continued on page 77)

COTTON YARN QUOTATIONS

(Corrected at close of business, Jan. 23, 1924)

Carded—(Average Quality)

Single Skeins and Tubes—Warp Twist

4s to 8s	.45	—46	20s	.51½	—52
10s	.—	—47	24s	.54	—55
12s	.—	—48	26s	.55	—56
14s	.—	—49	30s	.57	—58
16s	.50	—51	40s	.—	—66

Two-Ply Skeins and Tubes

8s-2	.—	—46	24s-2	.55	—56
10s-2	.—	—47	26s-2	.56	—57
12s-2	.—	—48	30s-2	.57	—58
14s-2	.—	—49	36s-2	.64	—65
16s-2	.51	—51½	40s-2	.67	—68
20s-2	.51½	—52	50s-2	.—	—75

Single Warps

10s	.—	—48	24s	.—	—55
12s	.—	—49	26s	.—	—56
14s	.—	—50	30s	.—	—58
16s	.—	—51	40s	.66	—68
20s	.—	—51½			

Two-Ply Warps

8s-2	.47	—48	24s-2	.56	—57
10s-2	.48	—49	26s-2	.57	—58
12s-2	.49	—50	30s-2	.58	—59
14s-2	.50	—51	40s-2 ordinary	.68	—70
16s-2	.—	—51½	40s-2 high breakage	.73	—75
20s-2	.—	—52½	50s-2	.78	—80

8s-3 and 4-ply skeins and tubes; tinged, 42½–43c.; white, 45c.; 10s-2 and 12s-2 slack twist, 47-48c.

Hosiery Cones (Frame Spun)

8s	.—	—48	22s	.—	—51
10s	.48	—49	22s Jaeger and silver	.—	—53
12s	.—	—49	24s	.—	—54
14s	.—	—49½	26s	.—	—55
16s	.49½	—50	30s tying in	.56	—57
18s	.—	—50½	30s extra quality	.60	—61
20s	.—	—51	40s	.66	—67

Combed Peeler—(Average Quality)

Warps, Skeins and Cones

20s-2	.66	—68	50s-2	.83	—85
30s-2	.73	—75	60s-2	.90	—95
36s-2	.77	—78	70s-2	1 05	—1 12
40s-2	.78	—80	80s-2	1 16	—1 25

Singles

12s	.57	—58	30s	.67	—69
14s	.58	—59	36s	.72	—75
16s	.59	—60	40s	.77	—78
18s	.60	—61	50s	.83	—85
20s	.61	—62	60s	.91	—97
24s	.63	—64	70s	1 05	—1 12
28s	.64	—66	80s	1 16	—1 25

Mercerized Cones (Combed, Ungassed)

26s-2	.81	—84	50s-2	1 02	—1 09
30s-2	.86	—89	60s-2	1 12	—1 22
36s-2	.90	—95	70s-2	1 28	—1 36
40s-2	.93	—95	80s-2	1 38	—1 53
45s-2	.98	—1 03			

Peeler (Super Quality)

Single Cones

	Carded		Combed			Carded		Combed	
10s	.50	—51	58	—60	26s	.58	—59	68	—70
14s	.52	—53	60	—62	30s	.60	—62	70	—72
16s	.53	—54	61	—63	36s	.64	—66	75	—78
18s	.54	—55	62	—64	40s	.66	—70	78	—82
20s	.55	—56	64	—66	50s	.—	—	85	—90
24s	.57	—58	66	—68	60s	.—	—	95	—1 00

Combed Cones, Warps and Tubes

20s-2	.68	—70	40s-2	.80	—85
24s-2	.70	—72	50s-2	.90	—95
28s-2	.72	—75	60s-2	1 00	—1 10
30s-2	.75	—78	70s-2	1 10	—1 20
36s-2	.78	—80	80s-2	1 20	—1 30

Combed Reverse Twist Thread Yarns—Skeins, Tubes or Cones

2-, 3- and 4-ply

	Peeler		Sakelarides Average	Sakelarides Best
24s	.88	—90	$ .95	$1.10
30s	.91	—93	.98	1.12
36s	.93	—95	1.00	1.15
40s	.99	—1 02	1.04	1.20
45s	.1 04	—1 06	1.12	1.25
50s	.1 09	—1 12	1.17	1.32
60s	.1 20	—1 25	1.30	1.45

Lack of Interest Noted in Yarns

Quotations Generally Lower—Some Business at a Price in Philadelphia

PHILADELPHIA.—The majority of dealers in this market have experienced a week of dull trading. Buyers are not disposed to make large commitments, although extremely low prices have been quoted them this week in comparison with recent selling prices. No large orders have been placed, the larger portion being for small quantities for immediate shipment, coming from dealers' stocks. Spinners are reluctant to meet selling prices in this market; for example many of them are quoting 30s-2 warps at 62 to 63c, while warps of this count sold during the week several cents lower. Carded yarns are generally 1c. lower with certain numbers showing even a larger decline, which has been caused primarily by lack of yarn business and by the decline in raw cotton. Although dealers are receiving small orders each day, the gross business has been small, with one or two exceptions where sizable lots have been sold at particularly cheap prices.

There is a wide difference between lowest figures spinners will accept and prices obtainable from buyers; in many instances this difference is 3 or 4c. It is admitted by those selling at present yarn cannot be made from 30c or higher cotton and sold at a profit. This is particularly true of 20s and 30s-2 warps, which are selling at prices that can leave very little margin for the spinner should it be necessary to purchase cotton at present prices. The fact is apparent however yarns are not selling on this basis. The reliable law of supply and demand seems to be the main factor in current yarn sales. The supply of yarn for the time appears to be in excess of the rate at which manufacturers are taking yarn, resulting in a gradual softening of values during the past few weeks. Dealers believe certain buyers will take advantage of this situation and purchase considerable yarn, while prices appear to be in their favor, rather than wait for the bottom to be reached, at which point comparatively few have been able to purchase in the past when conditions resembled those now confronting buyers.

Knitting Yarns Dull

Hosiery cones have been rather quiet, with business placed lower than spinners will consider. Sales from dealers' stocks of small lots have been made on the basis of 47c for 10s. Early in the week a sale of 16s cones

ABERFOYLE MANUFACTURING COMPANY

MERCERIZED YARNS

MAIN OFFICE
Bankers Trust Building
PHILADELPHIA

Volunteer Building
CHATTANOOGA, TENN.

Adams-Franklin Building
CHICAGO

Westaway Building
HAMILTON, CANADA

MILLS
CHESTER, PA.

Cotton Yarn Markets—Continued

was made at 50c and 18s at 50½c, while 30s tying in yarn sold at 56c. Underwear and hosiery mills are not active yarn buyers. They refuse to place future contracts, purchasing small lots as they are actually needed. Little interest in 30s single double carded is reported, small amounts selling at 58c. Several dealers say although the volume of orders placed during the week was small, it represents an improvement over that of last week. Others say they have had the dullest week for a long time, indicating the spotty condition of the market.

Quotations Lower

Weaving yarns are less firm in comparison with knitting, sales of 20s-2 and 30s-2 warps being reported at prices spinners will not meet. Spinners ask up to 63c for 30s-2 and 53c for 20s-2 warps, while sales of 20s-2 have been noted at 52c and several cents lower than 60c on 30s. Most of this business has been placed with dealers for delivery from their warehouses, on which they have a profit made even at the low prices at which the yarn is sold. An instance of a manufacturer paying 56c for 20s-2 warps was noted; this however was a special yarn for which a premium over the market value was paid for extra quality. Carpet mills are showing little interest, 10s-3 white stock selling at 46c, although spinners ask 46 to 47c for 8s-3, others quoting as high as 50c.

Combed Yarns Lower

Combed yarns continue quiet, prices being slightly lower. Spinners now quote better grades of 50s-2 at 85c for which they asked 89c two weeks ago; 95c for 60s-2 which formerly sold at $1.00. Sales of this number have been noted at 92c early in the week, with several dealers expressing a willingness to sell at 90c. should they receive an offer for any considerable quantity. A sale of 60s single was reported at 91c. Demand for combed yarns in two ply for use in mercerizing is small at present, which explains the continued softness in these quotations even though prices are practically at cost to spinners. A good quality yarn sold at 64c for 20s single, which is several cents higher than other dealers are willing to accept. On the other hand many spinners continue to ask 62 to 63c. for 18s single and 63 to 64c. for 20s, and other counts in the same proportion.

Mercerized Yarns Slow

Mercerizers report a lack of demand for yarns of this description. Business is largely confined to small lots, which manufacturers are usually able to secure 2c. below market values; for example a medium sized lot of 40s-2 mercerized was sold at 91c, while future business on this count will not be accepted by many factors at less than 93c.

Slow and Weak

Market Dominated By Distress Lots and Cotton's Weakness

BOSTON.—Aided by the slump in cotton prices, and by the efforts of many spinners to realize on accumulated stocks, the protracted test of endurance between yarn spinners and users has been won by the latter yet little effort is being made by them to capitalize the victory at present, it being the apparent belief of many buyers that they have spinners "on the run" and will be able to cover at their own prices when they are good and ready.

Trade Unsettled

On all varieties and counts of yarn the market has seldom been more unsettled; in fact, the prices being quoted by some spinners on stock lots, and by certain dealers in other markets on forward delivery, represent a demoralized condition when compared wth actual costs on the basis of current cotton prices, or even upon the basis of the low average prices at which cotton is owned by any considerable number of spinners. Stock lots of such staple counts as 20s-2 carded warps are reported available 2 or 3c below our quoted figures, and even if these are waste yarns and well below standard break they must represent a loss to the seller. The yarns that are offered for forward delivery are relatively low in price and represent "short selling" of a highly speculative character. In competition with such merchandising methods dealers and spinners who are attempting to secure at least cost price for yarns will be almost helpless as long as demand continues of such limited volume, or unless there is a marked advance in cotton prices.

For February-March delivery most spinners and dealers want a basis of 53 to 54c for 20s-2 carded warps spun from a middling white cotton, and 58 to 60c for 30s-2. For 10s frame-spun cones the minimum asking price is 48c and for 30s tying-in yarns about 58c. For peeler cones of super-quality the average asking price is 50 to 51c for 10s, and 60-62c for 30s. For combed peeler cones the basis is about 62 to 64c for 18s.

Combed Yarn Situation

The market is even more demoralized on combed weaving and mercerized yarns than it is on carded yarns; ordinary grades of combed peeler warps and tubes, of either regular or mercerizing twist, are reported available as low as 90c, and for average to high grades the range is from $1.00 to $1.10, with plenty of mercerizing warps of good average quality available within a range of 95c to $1.00 for 60s-2. Mercerized combed peeler weaving yarns are once more available close to the price of similar gray yarns, and the situation on mercerized cones is equally unsettled and unsatisfactory. Mercer-

GROVES MILLS, Inc.
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Combed Peeler Yarns
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BRADLEY MFG. CO.
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Whites, Stock, Dyed and Heathers
Cotton Yarns of Quality
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Spinners to Consumers
Carded and Combed Peeler single and ply Cones, Skeins, Warps, Tubes
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COTTON YARNS
Selling Agents
Linn-Corriher Mills—Hartsell Mills ompany
28s to 32s Cones Full Double Carded
10s to 20s Single and Ply

FORREST BROTHERS
Forrest Bldg., 119 S. Fourth St., Phila., Pa.
Superior Quality Knitting Yarns
Sole Representatives
Bladenboro Cotton Mills—Vass Cotton Mills
8s to 30s Extra Carded

T. MAXWELL MERYWEATHER
Cotton Yarns
Converted Artificial Silk Yarns
DREXEL BLDG. PHILADELPHIA

COTTON PRODUCTS COMPANY

High Grade Warps

for

MERCERIZING

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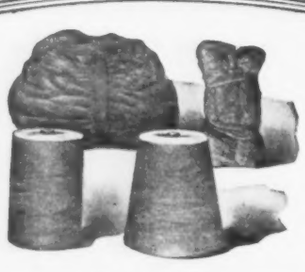

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INC.

COTTON YARNS

WEAVING AND KNITTING

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STANDARD COTTON MILLS
CEDARTOWN, GA.

Highest Quality Mule Spun Yarns
6s to 24s

ENSIGN COTTON MILLS
FORSYTH, GA.

Coarse Counts Quality Yarns
4s to 16s, Single and Ply

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MOHAIR, ALPACA
CAMEL HAIR
AND
CASHMERE YARNS
40s to 60s
For Weaving and Knitting

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The Speedometer of Industry

Every Productimeter we send out is put to extraordinary tests, to be sure it will record every stroke, and never jump. The thought behind is service—to see that you get the right kind of a counter—the one that will give you the right figures.

PROVE IT YOURSELF !

Tell us what kind of a machine you'll put it on, and what sort of a record you want. We'll send the "right" Productimeter. Use it one month. If you're not satisfied, return it, in good order, and we'll cancel the charge.

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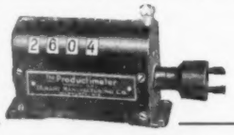

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Write for particulars of the added traverse with corresponding increase in yardage—an important feature of this spool.

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Water softeners for throwsters, scourers, bleachers, dyers and finishers

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Linen Threads and Harness Twines
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Engineers & Contractors
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Profit by
"HIGH DUTY CLIMATE"

Fitchburg Boston Charlotte

Cotton Yarn Markets — Cont'd

ized combed peeler cones, ungassed, are reported available as low as $1.05 for 60s-2, although the average asking range is from $1.10 to $1.20.

Buying on Reaction

Good Inquiry and Business on Cotton Yarns in Mid-West

CHICAGO.—Most of the large underwear manufacturers have taken advantage of the break in the cotton market, and are buying yarns on the reaction. They seem to feel that prices now are on a reasonable basis, and large contracts have been placed for both carded and combed peelers.

Good inquiries for yarn are also being received from hosiery and other manufacturers, who are of the opinion that the drop is merely temporary.

Offering is made of 20s-2 tubes white at about 55c., and 30s-2 at 58c., whereas 40s-2 are about 68c.; 10s-1 carded cones, southern frame spinning, about 50c., and 22s-1 about 53c., and 30s-1 special quality carded at 59c. to 60c.

N. Y. Cotton Yarn Market

(*Continued from page 73*)

between 6 and 7c. but this variation is not down to normal.

Hard to Force Business

According to a seller, the situation in the yarn market reminded him of the story of the man who ordered steak in a restaurant and was told by the waiter that he would have to eat it because two other customers had already refused it. The waiter was probably no more successful in marketing his product than the average yarn dealer, even though the latter has endeavored to employ equally strong arm methods. The buyer is skeptical of the stability of cotton. He looks for decided recessions within the next two or three months and expects to benefit accordingly. It is true that the dealer is forecasting a decline with the announcement of estimates on the new crop, but does not anticipate any material change until March or April.

In the meantime, although the spinner is in need of business, he is not likely to make any radical concessions as he owns comparatively little cheap cotton and cannot afford to sell at a loss. This explains the comparative firmness of the yarn list in the face of the weakness which has developed in raw material.

Curtailment Increasing

Reports from the South indicate that while little noise is being made about it, considerable curtailment in the aggregate is going on. Mills are shutting down two or three days a week or their week ends on Thursday or Friday. This probably explains why there is a minimum amount of accumulation, either in the hands of spinners or in the selling market. Very little consigned yarn is in the possession of dealers. While more or less material has been

CANNON YARNS

Cotton Yarns *of* Quality

Quality:—We invite inquiries from the Knitter who puts *Quality* above *Price*—Who is proud of his product and guards it jealously. *Cannon Yarns* are dependable—The same high quality is maintained year after year.

The yarn is the product of our own mills, and back of every pound is the guarantee of

THE CANNON MILLS

INC.

From Spinner Direct to Manufacturer

PHILADELPHIA

New York Providence Boston
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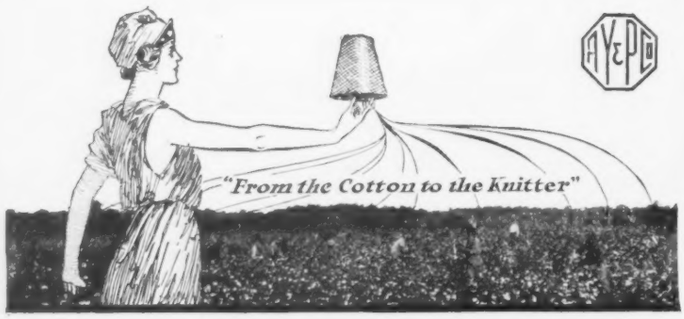
THE STANDARD OF VALUE & QUALITY



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Spinners and Mercerizers

High Grade Combed and Carded Yarns

Our Mercerized Yarns are the Product of Our Own Mills

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FORREST BROTHERS
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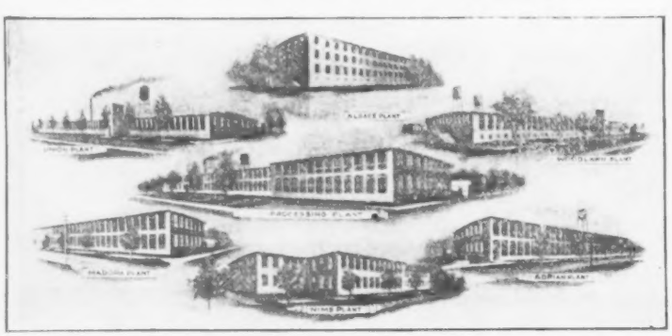

New Bedford Leads the Country

Washington, Dec. 22 — New Bedford is a pretty desirable place to live in, according to the report of the Department of Commerce, which gives figures showing that the city had the lowest death rate for the week ending Dec. 15, of all the large cities in this country — and there were 72 reporting. New Bedford's death rate is 6.0 for the week ending Dec. 15, of this year, as compared with the highest death rate of 22.9 for Jacksonville, Florida.

The operatives in our mill are satisfied One reason for this is the climate. Actually New Bedford offers opportunities to mill employes that cannot be surpassed in the United States.

AND — it is a truism that the more contented a man is the better work will he do. We believe that the superior quality of Quissett Yarns is a proof of that fact.

Carded and Combed Cotton Yarns in all Numbers and Descriptions

Ply Yarns our Specialty

Egyptians, Sea Island, Peelers, Sakelarides.

Quissett Mill

New Bedford, Mass.

Wm. M. Butler, Pres.
Edward H. Cook, Treas.
Thomas F. Glennon, Agent

QUISSETT MEANS QUALITY

Cotton Yarn Markets—Continued

offered on this basis, yet it has usually been of counts that were not moving and has been refused. Standard numbers have been moved during the last six months in sufficient quantity to prevent any accumulations in the hands of dealers and commission merchants. The latter have been very cautious about operating on the current basis for they too share the belief that cotton is not likely to be maintained at its present level and do not wish to repeat the disastrous experience of the early months of 1923.

Hosiery Yarns Flat

It is a very difficult matter to secure an offer from a knitter today. If the latter should make a proposition, it is usually snapped up, even though spinners may be unwilling to quote the price named. Illustrative of this fact is the reported condition on 22s cones. Telegrams have been received from spinners to the effect that they will not accept anything under 52c., but at the same time if the dealer had an offer of 50c., it is not believed he would hesitate very long in accepting it for he is of the opinion that he could cover with the spinner at this price.

The disposition of certain hosiery yarn spinners to seek business on twisted yarns, which was apparent in the installation of twisters in a good many mills during 1923, has decidedly changed and the lack of profit on weaving yarns has soured the spinner on his experience in this line, with the result that he is again seeking business on single yarns.

Cotton Yarn Trade Notes

Announcement is made that a co-partnership has been formed by W. M. Sharples, George J. Dougherty and Wm. H. Schmierer, trading under the name of W. M. Sharples & Co., cotton yarns at 130 Chestnut St., Philadelphia.

The Gray-Separk group of fine yarn mills, Gastonia, N. C., have opened a sales office at 914 James Building, Chattanooga, Tenn. C. L. Page formerly in the yarn business in Philadelphia is in charge.

To Fight the Weevil

RALEIGH, N. C.—A series of meetings to discuss ways of combatting the boll weevil will be held in the southern section of the State, beginning the latter part of this month, according to announcement by Franklin Sherman, State entomologist. A series of similar meetings now is in progress in the northern section of the State. The Soil Improvement Committee of the Southern Fertilizer Association will co-operate with the State in holding the meetings. Not only farmers but business men generally are urged to co-operate in the meetings, as it is recognized that boll weevil destruction affects the community as a whole almost as much as it does the farmer.

Quiet Waste Market

Consumer Buying Rather Inactive on Current High Level

BOSTON.—The cotton waste market is steady with prices firm. Consuming interest, however, is not developing very rapidly but no one seems to be particularly apprehensive on this score. Quotations for the various classifications show little if any change. Choice spinnable materials held strong against the recent downward movement in cotton. Comber is slated for 90% or better to consumers, and choice peeler strips will follow closely after. High contract prices made for picker and fly in the dirt will mean a much higher level for willowed picker and fly during the year. Removal of the 5% ad valorem duty will now furnish a strong incentive to larger imports. At the present time, however, both the British and Continental markets are quite high but the removal of this duty coincident with prevailing low British exchange may bring about larger receipts in low grade materials in the not remote future.

The situation in cotton wastes, according to an experienced trader in the market, is quite abnormal and not without elements of danger. Very high prices have been paid for contracts covering the greater part of 1924 and this applies to all classifications of material. A good percentage of last season's cotton crop is said to be low-grade. In spite of this strips have been contracted for on a level which is on the average higher than at the beginning of 1923. The recent weakness in cotton has been rather disturbed but as a mental back-log to the market there is the moral certainty that if cotton manufacturing becomes anywhere normal throughout the world a shortage of staple will be quite apparent.

November consumption of cotton totalled 531,001 bales which fell in December to 461,661, not a very bad showing in light of the pessimism which has been exhibited in cotton manufacturing circles during the last three or four months.

Current Quotations

Peeler comber	31 —32c
Peeler strips	30 —31c
Sak. comber	29 —29½c
Sak. strips	28½—29c
Choice willowed fly	15 —16c
Choice willowed picker	12½—13½c
Linters (mill run)	9 — 9½c
Spooler (single)	17 —17½c
Fine w.h. cop	19 —20c

D'Olier Election

At the annual meeting of Franklin D'Olier & Co., Inc., Phila., cotton yarns, officers elected for the current year were Franklin D'Olier, president and treasurer; S. M. D. Clapper, vice-president and general manager; and Thomas P. Walker, secretary. The following directors were elected at this meeting: Franklin D'Olier, S. M. D. Clapper, Winthrop Mincher, Thomas P. Walker, James D'Olier, and G. A. Dalglish.

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JESSE P. EDDY, Treas.
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COTTON YARNS
All Qualities

GATE CITY COTTON MILLS
Manufacturers of Superior Quality
WHITE HOSIERY YARN on CONES
We sell direct to Knitters and guarantee satisfaction
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Karded and Combed Cotton Yarns
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JOHN F. STREET & CO.
COTTON YARNS
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CHICAGO PHILADELPHIA NEW YORK

THE J. R. MONTGOMERY CO. WINDSOR LOCKS, CONN.
Manufacturers of
MERCERIZED COTTON YARNS Give the high Silk-like lustre
In Knit Goods and Woven Fabrics
NOVELTY YARNS Poucle, Bourette and Spirals in Cotton, Wool, Worsted, Mohair and Silk
COTTON WARPS On Beams, Jacks, Spools and Tubes
In Fancy Twist, Colors and Printed

EWING-THOMAS CONVERTING CO.
Specialists in Mercerized Yarns CHESTER, PA.
Warp Mercerizing for the Trade
Gassed—Natural—Bleached—Colors
DOUBLE MERCERIZED SPECIAL PROCESS

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Carded and Combed Cotton Yarns

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Audrey Spinning Mills, Inc., Weldon, N. C.
White Hall Yarn Mills, White Hall, Ga.
Chatham Mfg. Co., (Cotton Dept.) Elkin, N. C.

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Sole American representative of

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Manchester, Eng.

Spinners and doublers of fine cotton yarns especially adapted for the making of laces, voile, fine hosiery dress goods and insulating wires.

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Combed and Carded

COTTON YARNS

For Weaving, Knitting and Converting

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ALL KINDS
ALL COUNTS
ONE QUALITY

YARNS FOR KNITTERS

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Wool
Worsted
Merino
Silk Mixtures
Heather Mixtures

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CARVER-BEAVER YARN CO., Inc.

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Manufacturers of

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COTTON YARNS

Double Carded Combed

SPECIAL MERINO

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CATLIN & COMPANY

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and other mills furnishing full range of all numbers

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Cotton Yarns

Philadelphia Boston

O. S. HAWES & BRO.

FALL RIVER, MASS.

COTTON YARNS ALL FORMS AND NUMBERS

MONUMENT MILLS, Housatonic, Mass.

HIGH GRADE COTTON YARNS, White, Colors, Bleached
On Beams, Jack Spools, Cones, Skeins, and Chain Warps

FAST-BLACKS & COLORS { For Woolen Mills a Specialty } WE SELL DIRECT

COTTON MARKETS

Cotton Trade Waits On Goods or Crop

Futures in Firmer Position But Improved Goods Demand Needed to Back Advance

While the cotton market has shown evidences of a better liquidated position combined with an absence of spot pressure in the South, there has been no revival of general buying interest during the past week and rallies have not been fully maintained. The break which began shortly after the opening of the new year continued until March contracts sold at 32.37 and May at 32.60 a week ago Friday. At these prices the market was at the lowest levels touched since the old bull movement culminated, and showed declines of approximately 4½ to 4¾c. as compared with the high records of last November. Offerings then subsided, and there were rallies on covering, promoted by reports of a firmer spot basis in the South but the advances were checked by increased offerings above the 33½c. level for May deliveries and the market showed renewed irregularity later in the week.

Briefly the market has reached a point, where it appears to be pretty delicately balanced. On the one hand there is the strong statistical position and the apparent absence of spot pressure. On the other there is the continued dullness of the goods trade and the talk of increasing mill curtailment. It is impossible for the individual trader to make certain in his own mind whether the one counter-balances the other. He is waiting for some clearer indication as to the facts in this connection, or for the development of new crop prospects to inspire a fresh view of the market's future. In the meantime trading in futures has narrowed materially rendering the market sensitive to comparatively small orders either way, and while the negative influence of slow marketing by remaining spot holders asserts itself as a sustaining factor on declines, the market lacks the positive influence of an active trade demand, to maintain the advances.

Nothing has developed to throw any fresh light on the new crop. Most traders think that weevil have been killed by the low temperatures, while they believe that with a good season in the ground, an increased acreage may produce a larger yield per acre this year.

The Liverpool market has been unsettled by British political conditions and the development of the railroad strike. Notwithstanding these features, however, trade advices from Manchester have been rather more encouraging than otherwise.

One of the features recently has been a narrowing of the new crop discount. Perhaps it would be more correct to describe this as a reduction in the old crop premium, but the fact remains that while October was recently selling fully 600 points under July, the discount has narrowed to about 400 points.

The following table will show Tuesday's closing quotations in the leading spot markets of the country, with the usual comparisons:

Market	Jan. 16	Jan. 22	Change	Last Year	Sales
Galveston	33.70	33.20	—50	28.60	6,291
New Orleans	33.88	33.38	—50	28.63	2,480
Mobile	33.00	32.50	—50	28.25	19
Savannah	33.05	32.58	—47	28.75	652
Norfolk	33.38	33.06	—32	28.75	683
New York	33.80	33.25	—55	28.60	....
Augusta	33.38	33.00	—38	28.75	569
Memphis	34.00	33.75	—25	28.75	8,250
St. Louis	34.00	33.50	—50	28.50	....
Houston	33.55	33.10	—45	28.55	4,719
Dallas	....	32.45	....	27.70	10,900

The following differences on and off middlings are given as compiled from the reports received by the New York Cotton Exchange. The cotton grades marked ** are not deliverable on contract.

WHITE GRADES

	Dallas	Memphis	Montgomery	Augusta	Average
M. F.	1.75†	2.00†	1.62†	1.62†	1.81†
*S. G. M.	1.50†	1.75†	1.37†	1.37†	1.48†
G. M.	1.25†	1.50†	1.12†	1.12†	1.16†
S. M.	.75†	.75†	.75†	.75†	.70†
S. L. M.	1.25*	1.50*	1.25*	1.25*	.98*
L. M.	2.50*	2.75*	2.50*	2.50*	2.20*
**S. G. O.	3.50*	3.75*	3.75*	3.75*	3.68*
**G. O.	4.50*	5.00*	5.00*	5.00*	5.00*

YELLOW TINGED

G. M.	.25*	.25*	.25*	Even	.22*
S. M.	.75*	.40*	.63*	1.25*	.71*
**M.	1.75*	1.65*	1.50*	2.50*	1.75*
**S. L. M.	2.50*	2.75*	2.75*	3.75*	2.97*
**L. M.	3.25*	3.75*	4.00*	5.00*	4.17*

YELLOW STAINED

G. M.	1.00*	1.00*	1.25*	1.50*	1.25*
**S. M.	1.50*	1.50*	1.75*	2.00*	1.95*
**M.	2.00*	2.25*	2.50*	2.50*	2.65*

BLUE STAINED

**G. M.	1.25*	.75*	1.13*	1.50*	1.25*
**S. M.	1.75*	1.25*	1.63*	2.25*	1.76*
**M.	2.50*	1.75*	2.38*	3.00*	2.64*

*Off middling. †Middling.

COTTON STATISTICAL DATA

Fluctuations of Futures
Closed —For week— Closed

Option.	Jan. 15.	High.	Low.	Jan. 22.	Chge.
January	32.85	33.00	32.15	32.83	—1.02
February	34.03	33.00	32.83	32.95	—1.08
March	34.21	33.38	32.37	33.07	—1.14
April	34.31	33.26	32.82	33.17	—1.14
May	34.41	33.57	32.60	33.28	—1.13
June	34.02	32.97	32.52	32.90	—1.12
July	33.35	32.55	31.52	32.20	—1.15
August	31.25	29.90	29.65	29.65	—1.60
September	29.47	28.82	28.49	28.55	— .92
October	28.60	28.20	27.70	27.82	— .78
November	28.45	28.10	27.68	27.82	— .63
December	28.30	27.75	27.20	27.36	— .94

Spot Fluctuations for Week
MIDDLING

	New York	New Orleans	Liverpool
Friday, Jan. 18	33.20c.	33.25c.	18.83d.
Saturday, Jan. 19	33.35c.	33.38c.	18.90d.
Monday, Jan. 21	32.90c.	33.13c.	18.65d.
Tuesday, Jan. 22	33.25c.	33.38c.	18.79d.
Wednesday, Jan. 23	34.00c.	33.75c.	19.25d.
Thursday, Jan. 24	33.80c.	34.00c.	18.95d.

Spot Fluctuations and Stocks

	Spot prices	This week	Last year
Galveston	33.20	307,015	321,806
New Orleans	33.38	227,628	217,882
Mobile	32.50	13,197	10,462
Savannah	32.58	72,079	71,359
Charleston	....	33,778	54,588
Wilmington	32.60	19,212	19,742
Norfolk	33.06	88,203	106,314
Baltimore	32.75	3,298	3,066
Augusta	33.00	46,824	67,591
Memphis	33.75	116,373	156,387
St. Louis	33.50	6,653	19,271
Houston	33.10	298,341	321,954
Little Rock	33.25	36,907	54,642

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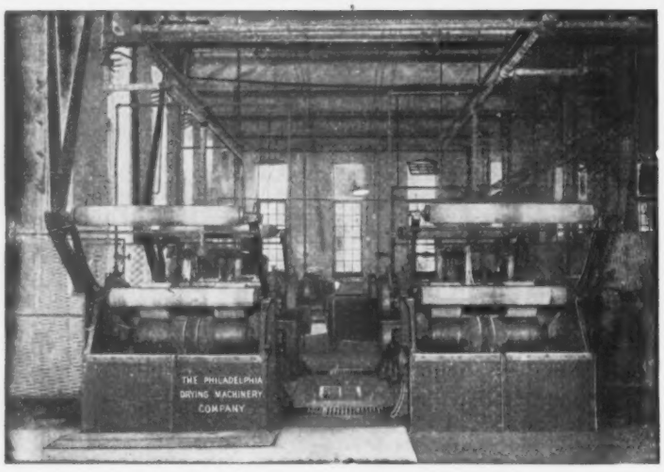

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Cotton Markets—Continued

Staple Demand Absent

Cotton Futures Disappoint—Good Cotton in Memphis Stocks

MEMPHIS, TENN.—Some 1 3/16 in. staple averaging only a little better than middling sold here during the week at 37½c. However demand for staples has been about as near a standstill as ever before this season. Heretofore differences in price ideas between buyers and sellers have restricted business, but recently inquiry for anything above commercial 1⅛ cottons has been lacking, with the exception of a rather mild interest displayed for 1¼ strict middling on which no business was put through.

A look through the sample rooms of factors is convincing that the stocks held here are rather nice cotton. Disappointing performance of cotton futures markets since the turn of the year has puzzled the trade here perhaps more than it has weakened confidence, although there are evidences of waning faith. For the first time this year unsold stocks are larger than they were at the corresponding time last year, although the total stock is some 40,000 bales smaller than last year's.

Fairly good sales during the week included an unusually large precentage of f. o. b. cotton of short lengths and grading mostly between strict good ordinary and strict low middling. While some small filling-in orders may be the exception, only a little of the buying now being done is considered new business. Reports indicate that the staple association has been making some sales to local buyers, but otherwise that its volume of sales has been in line with the stagnation prevailing here.

Want Quick Maturing Cotton

Weather conditions have again been unfavorable for field work but quite favorable for soil condition and against winter survival of insect pests. It is as yet too early to consider as unfavorable delays to planting preparations even in the far Southwest. Demand for planting seed is getting under way, and indications point to a very large increase in acreage in Missouri, Illinois, Kentucky and other sections of the fringe of the belt. Inquiry is for quick maturing varieties of large ginning output in proportion to given quantities of seed cotton; this, of course, means the short lint varieties.

Strict low middling 1⅛ to 1 3/16 staples sold here during the week at 34½ to 35½c. while 1 1/16 cottons of the same grade brought around 33c. Some good ordinary 1 1/16 sold as low as 27c. while a sale of Missouri good ordinary at 20c was reported. Sales of middling inch cotton are being made at a price even with March contracts New York.

Staple Cottons Off a Cent

Little Buying or Fixing of Prices on the Decline

BOSTON, JAN. 23.—The decline in staple cottons shorter than quarters has been fully proportional to the decline in futures and short Upland cottons, and has stimulated very little actual buying or fixing of prices. Extra staple domestic cottons are nominally unchanged in price. They being held in comparatively few hands and these are remaining independent in their price attitude. However, it continues possible to pick up quarters and other extra staples in middling and higher grades 1 to 2c. below nominal quotations. The decline in Egyptian Uppers on the spot and for prompt shipment has been practically the same as that in the shorter domestic staples, while Sakellarides has dropped fully 2c. a pound as a result of continued slack demand in all markets.

Evidence that the recent general frost in the various staple sections of the South has increased the supply of low grade cottons is found in the freer offering of these at a wider basis on May. However, there is a wide variation between prices quoted on low grades by different shippers, and it is evident that it will pay a spinner needing these cottons to shop the market carefully. An instance of the wide disparity of such quotations may be found in the fact that for low middling western 1 to 1 1/16-inch that is really better than "contract cotton" basis varies from as much as 300 points off May to even with May. The cotton quoted is of full length and will give a satisfactory break in 30s to 36s warps.

Tire cord and cloth manufacturers have been showing a little more interest in Egyptian Uppers during the last two weeks, but their purchases thus far have been only of small lots of spot and prompt shipments. Sak. continues neglected. The Alexandria

Market Statistics

Basis Middling

	Saturday, Jan. 19	Saturday, Jan. 12
10 markets average	33.09c.	33.71c.
Memphis	33.75c.	34.00c.

Premium Staples

Week's Sales Factors' Table Memphis
Grade Strict Middling. Prices Nominal.

1 1/16-in.	35.35½c.	1 3/16-in....	37½-38½c.
Basis	36-36½c.	1¼-in.	23½-40c.

Current Sales

	For Week.	Week Previous.	Week Before.
Memphis, total	12,250	10,650	6,550
Including f. o. b.	10,800	5,650	3,350
10 Markets, total	50,802	72,955	51,353

Memphis Receipts, Shipments Etc.

	For Week.	Last Year.	Year Before.
Gross receipts	27,571	27,131	17,185
Shipments	27,908	35,030	23,122
Net receipts	8,617	3,531	4,089
Total since Aug. 1, net	210,247	307,135	284,318
Total stock	118,560	159,588	251,411
Decrease for week	237	7,919	5,927
Unsold stock	73,000	64,000	140,000
Decrease for week	*3,000	10,000	9,000

* Increase.

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from the

LENOIR COTTON MILLS

In spinning this well known product no effort is spared to make it worthy of being used in the finest of fabrics.
It is supplied in sizes ranging from 50s to 60s in skeins, warps, cones and tubes.

Lenoir Cotton Mills — Whitnel Cotton Mill Co.
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26s to 40s Carded — 50s to 60s Combed

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Excelsior TINTED Yarn —a huge success

The introduction of Excelsior Tinted Single Mercerized Yarn to the trade created quite a stir. Though new, the idea was immediately recognized by knit goods men as a great improvement. Any doubts that were held were immediately removed by making tests.

If you splice or plait hosiery let us send you a cone of this yarn. The color means the immediate detection of errors; material is saved and production increased. The color is immediately washed out in the dyeing or bleaching process. Write for a sample cone.

Accept no substitutes.

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Dyers, Bleachers and Mercerizers of Cotton Yarns in Warps or Skeins

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A new plant, latest and most modern machinery and equipment, backed by thirty-five years of specialized experience, guarantees service and satisfaction.

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GEORGE H. WARING & CO.

Southern **COTTON YARNS** *Eastern*

FALL RIVER, MASS.

J. J. KENYON MFG. CO.

Manufacturers SILK FINISH TAPES and BRAID

GLAZED AND COLORED YARNS

ON SPOOLS, TUBES, CONES, ETC.

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ABSOLUTELY FAST COLORS

COTTON WARPS

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WHITE and COLORED SINGLE and PLY SELL DIRECT

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TESTS: Raw, Thrown, Spun and Artificial Silks.
Silk, Wool and Cotton Fibres. Yarns and Fabrics.
Fuels, Oils, Soaps, Waxes, Waters, Dyestuffs, etc.

TESTING HOUSES New York Philadelphia Paterson New Bedford Shanghai

Cotton Markets—Continued

and Liverpool futures markets are practically unchanged for the week.

Prices of Deltas and Egyptian

Average prices for middling and strict middling hard western cotton (full lengths) for February-March shipments are as follows:

	Middling	Strict Mdlg
1 1/16 in.	36 to 36½c.	37 to 37½c.
1 1/16 to 1⅛ in.	36½ to 37c.	37½ to 38c.
1⅛ in.	37 to 37½c.	38 to 39c.
1 3/16 in.	38 to 39c.	39 to 40c.
1¼ in.	40½ to 42c.	43 to 46c.

John Malloch & Co., Boston, quote Egyptian cotton for prompt shipment c. i. f. Boston, as follows: Medium Sakalarides, 41⅜c., off 2⅛c. from Jan. 16; Medium Uppers 41⅜c., off 1⅛. They report closing prices Jan. 23 on the Alexandria exchange as follows: Mar. (Sak.) $44.12, off 38 points from Jan. 16; Feb. (Uppers) $42.35, up 10 points.

New Wool Ruling

The Bureau of Animal Industry recently issued a tentative regulation which required disenfection, transportation in special cars, and storage in special licensed warehouses of all Asiatic and North African wools, for the prevention of the spread of anthrax, foot and mouth disease, etc. This regulation, known as tentative regulation No. 6, was to have gone into effect Mar. 1, 1924. The legislative committee of the Philadelphia Wool and Textile Association realizing the radical effect such a ruling would have upon all wools coming under proposed ruling, met and decided to point out to the Bureau at Washington, the lack of necessity for the new regulation. Through their efforts the regulation has been amended to admit without disenfection all wools with the exception of camel hair, which will be subject to the requirements of this regulation. The committee however is now concentrating their efforts in an endeavor to convince the Bureau that this hair also could also be admitted in like manner without danger of spreading the diseases mentioned in the country.

Southern Mill Stocks

(Continued from page 71)

Mosgrove Cotton Mills	90	92
Newberry Cotton Mills	141	140
Ninety-Six Mills	150	....
Norris Cotton Mills	97	100
Oakland Cotton Mills	125	130
Ora Cotton Mills	114	116
Ora Cotton Mills, pfd.	98	100
Parolet Mfg. Co.	227	230
Parolet Mfg. Co., pfd.	102½	103
Pacola Cotton Mills, Class A, pfd.	....	....
Pacola Cotton Mills, Class B, pfd.	96	98
Pelham Mills	....	37
Pickens Cotton Mills	141	....
Pickens Mfg. Co.	169	172
Poe, P. W. Mfg. Co.	140	142
Poinsett Mills	112	116
Riverside Mills (Par $12.50)	9	10
Saxon Mills	111	113
Sibley Mfg. Co., Ga.	78	80
Spartan Mills	170	173
Tuxaway Mills (Par $25)	37	38
Union-Buffalo Mills	85	90
Union-Buffalo Mills, 1st pfd.	95	96
Union-Buffalo Mills, 2nd pfd.	58	58½
Victor-Monaghan Company	120½	122
Victor-Monaghan Company, pfd.	114	117
Ware Shoals Mfg. Co.	....	200
Watts Mills	90	....
Watts Mills, 1st pfd.	103	106
Watts Mills, 2nd pfd.	140	146
Whitney Mfg. Co.	108	111
Williamston Mills	190	....
Woodruff Cotton Mills	195	201
Woodside Cotton Mills	130	132
Woodside Cotton Mills, pfd.	93	95

Honor Sec'y Mellon

Sec'y Andrew W. Mellon, U. S. Treasury Dept., was the guest of honor at a "Morris to Mellon" dinner tendered by the Manufacturers' Club, Philadelphia, Saturday, Jan. 19, in which the textile industry played a prominent part. The occasion was one of the most brilliant ever held by this business men's organization. John Fisler, Yewdall & Jones Co., Phila., president of the Manufacturers' Club, acted as toastmaster. The speakers included Hon. George Wharton Pepper, Senator from Pennsylvania; Congressman L. T. McFadden from Philadelphia, and Asst. Sec'y of the Treas. Elliot Wadsworth. The successful achievements of Sec'y Mellon's administration in reducing the public debt, the budget, the progress made toward funding the foreign loans, notably that of Great Britain and numerous other economies were recounted. The sound basis for the so-called "Mellon plan" for the reduction of the nation's taxes was also indicated with the reports of the time and experience given over to the study of the details of this plan before it was made public generally. Pennsylvania was proud to place him side by side with Robert Morris, the financier of the Revolution, also a Pennsylvanian. A gold medallion, bearing the likeness of Mr. Mellon on one side, and that of Robert Morris on the other, was presented to the guest of honor, with a replica of this in a bright metal for every guest present.

Argue Price Maintenance

WASHINGTON, D. C.—The resale price maintenance policy of Oppenheim, Oberndorf & Co., Sealpax makers, of Baltimore, has been well within the law as defined by the United States Supreme Court, a brief filed by the firm's attorneys with the Federal Trade Commission asserted. The Commission has pending on its docket a complaint against the Baltimore firm, whose attorneys are W. C. Chestnut and S. R. Warnken. Recent decisions of the Supreme Court have clarified the law on the subject in such a way that the legal limits of the manufacturer can be fairly well determined, the brief commented. Such instances as may not seem to be within the law, the attorneys contended, are not sufficient to condemn the whole of the Sealpax company's resale policy and class it as a system or scheme of unfair competition. It was submitted that the testimony of jobbers who appeared in the case conclusively proved that no such scheme exists by which the company's prices are maintained.

Forrest Co. Expands

To take care of growing business, the Forrest Mercerizing Co., Gloucester, N. J., single splicing and plaiting yarns, have placed orders for additional equipment which will increase their present capacity 25%.

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IN quality—in economy—in general characteristics STANDARD MERCERIZED YARN is unexcelled.

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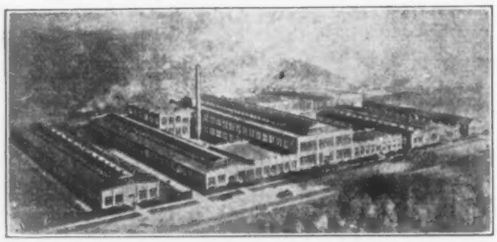

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FOR WEAVING AND KNITTING
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Trade both in Grey and Mixtures

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SWEATER WEAVING
YARNS
COLORS, OXFORDS
AND FANCY MIXES

Knitted OUTERwear

French and English Spun Worsted
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Incorporated 1904

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YARNS
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THE YEWDALL & JONES CO.
Manufacturers of **WORSTED YARNS**
In the gray and in all colors: also fancy mixtures and double and twist
PHILADELPHIA, PA.

JAMES DOAK JR. COMPANY
WORSTED SPINNERS
KENSINGTON PHILADELPHIA

WORSTED YARN MARKET

Worsted Yarn Demand Improves

Sales at Higher Prices Noted—Knitting Yarns Active—Prices Firm

Although there has been no large buying movement in worsted yarns during the week, a noticeable improvement in the volume of business taken and prices paid is evident. A fair amount of men's wear orders for yarn have been placed at figures higher by 10c. than the lowest point reached several weeks ago, when for example 2-40s half blood sold at $2. Sales of a good yarn made from half blood stock are reported this week at $2.15 and $2.17. Dress goods manufacturers have not made extensive commitments, dealers reporting a poor demand from this trade. Knitting yarns are displaying considerable activity at slightly higher prices. All trades of this class are showing interest, placing fair sized orders, with the majority of business for quick delivery, others specifying February and March shipments.

Buyers Conservative

A large portion of the week's business has been for knitting qualities; while men's wear mills are purchasing more than for several months, the situation has not improved as yet to the extent that spinners are sold ahead. Buying is of a conservative character, with manufacturers placing orders large enough only to cover goods orders received by them. Though the formal openings of heavyweight goods have been delayed several good orders have been consummated, resulting in the sale of 2-40s and in fewer instances of 2-36s, three-eighths, with single filling yarns in white, colors and mixes. Beyond this buyers appear unwilling to go, notwithstanding the fact prices of many counts are down to actual cost to the spinner based on current wool values. While they admit prices of yarn do not leave a large margin for the spinner who must buy wool, they feel prices are high enough to warrant them in pursuing a hand-to-mouth method rather than ordering for their future needs.

On the other hand spinners refuse in many cases to accept orders for later delivery than February at today's quotations. They feel yarn values must eventually work up nearer to replacement wool costs, and therefore wish to be in position to take orders when this occurs. Manufacturers have professed a willingness to order ahead when a particularly cheap price is quoted. Spinners however, will not consider such offers, except to move stock lots. The tendency for cheap lots to disappear is apparent. As they are cleaned up certain spinners have advanced their prices 10c. a lb. for further business. This is necessary as they are compelled to pay more for wools each week. For example it is said to be impossible for a spinner of 2-50s to buy wool today and sell at the prices mills offer for this number, which is about $2.40, although many spinners are asking $2.60, as the lowest at which they can sell present production.

Men's Wear Waiting

Men's wear demand runs largely to 2-40s half blood, and 2-36s three-eighths, many spinners quoting the former up to $2.35, while orders for 2-36s have been placed at $1.80 to $1.85, although asking prices run to $1.95 on this count. This trade is awaiting the opening of new season goods, with the majority delaying until the largest factor in the market open their lines. This will give them a good idea of prices they can expect for their goods and also on this basis prices they can afford to pay for yarns needed. Certain manufacturers have sold their new fabrics to a small extent already and have placed yarn orders to cover this business. Mills however, are generally waiting before naming prices, believing nothing can be gained by hurrying their customers at this time.

Knitting Yarns Improve

The greatest interest in the market has been the increasing demand for knitting yarns. All trades are taking fair sized amounts for early shipment. The bulk of orders call for immediate delivery, with a smaller proportion specifying shipments up to March 15. In many instances manufacturers receiving a quotation for stock lots have endeavored to place future contracts at the same figures. These offers are generally refused by spinners. Prices of 2-20s, low quarter, have been raised 5c. due to higher prices paid for wools of this grade, which also applies to 2-20s ordinary quarter blood stock on which spinners quote $1.45 to $1.55, with a larger number asking the higher price. Astrakan roving is in good request, with sales reported at $1.10 to $1.15. Jersey cloth yarns are in improved demand, both white and heather mixtures being specified, mostly in single yarns, either Bradfors or French spun. Hosiery yarns continue quiet with no sales of importance noted. Underwear mills show more interest in yarns, several fair sized orders for merino qualities for the coming season being reported.

Knitting spinners say yarn costs them 5c. a lb. more on an average than manufacturers will pay, based on present wool values. For example high quarter blood wool has risen from 80c. to approximately $1.00, while prices of yarn have risen only 5c. a lb. during the same period. Notwithstanding this fact a healthy condition exists among the majority of spinners of these yarns at present, several of whom are sold ahead for the next few weeks. Bathing suit yarns, particularly 2-26s quarter blood, are in active request, prices varying from $1.50 to $1.60 in sales noted. Outerwear yarns as a group, in numbers from 2-18s to 2-30s, are moving well at full market values, selling on a basis of $1.45 for a good 2-20s quarter blood grade.

Yarns Waiting

Fine Business Being Done Mostly Below Replacement Cost

BOSTON.—The worsted yarn market is still waiting, in a large sense, for the opening of the heavy-weight season and in the meanwhile such business as is being done in men's wear yarns is at prices not much different from a month ago. There is some semi-speculative purchasing of men's wear yarns wherever weavers can pick up parcels at what an agent terms "give-away prices." But there is little or no operating in large volume on cost determined by the situation in wool and tops. The situation is not altogether satisfactory and is emphasized by the hesitation of manufacturers over a long period to purchase wools in volume in the domestic foreign markets.

Spinners are holding things together as firmly as they can and are endeavoring to obtain prices more in keeping with replacement values. In the meantime they are making all possible concessions and have been able recently to obtain fine and half blood tops at 1c. or 2 a lb. below recent high levels. In volume of business knitting yarns lead with dress goods next and weaving yarns making a bad third.

The coarser counts of yarns are doing very much better than the finer qualities. This is owing to moderately good business in outerwear knitted garments and fabrics which call for yarns spun from low cross-bred tops. Top makers in this market on account of rapid advance in low grades in South America and New Zealand have advanced their quotations strongly this week, approximately 3-4%. In general it seems as though spinners were willing to do all the business they could on the basis of whatever wools and tops they may have below the market leaving the future, in absence of definite information regarding the goods opening, to take care of itself. Quotations ought to be considered more or less nominal at the present time.

Tops Irregular

Fine Tops Softer, Crossbreds Higher—General Noil Advance

BOSTON.—The top market so far as the finer qualities are concerned is still awaiting developments that are expected to occur from the heavy-weight opening. In the meanwhile under the pressure of spinners and others for lower prices, half blood and fine tops are 1% lower for the week; but as an offset to this top makers have advanced prices for 36s and 40s approximately 4%. Tops grading 56s down to 36s are in good demand.

The slight depression in finer qualities is not considered to be permanent, everything pointing to an upturn. The amount of fine and half blood wool available in the United States is relatively limited and advancing foreign markets make it altogether improbable that there will be any material decline either in fine wools or tops. Developments, however, are retarded by the deferred heavy-weight opening.

All classes of noils show an advance

Quotations

(Corrected at Close of Business Wednesday)

Bradford System

2-12s to 2-16s, low com	1 15	—1 20
2-20s to 2-24s low ¼	1 20	—1 30
2-20s to 2-26s, ¼ blood	1 45	—1 55
2-26s to 2-30s, ¼ blood	1 50	—1 60
2-30s to 2-32s, ¼ blood, S. A.	1 50	—1 60
2-32s, ¼ blood	1 60	—1 65
2-20s, ⅜ blood	1 65	—1 70
2-26s, ⅜ blood	1 70	—1 75
2-32s, ⅜ blood	1 75	—1 80
2-36s, ⅜ blood	1 80	—1 85
2-32s, ½ blood	2 00	—2 10
2-36s, ½ blood	2 05	—2 15
2-40s, ½ blood	2 15	—2 25
2-50s, high, ½ blood	2 40	—2 45
2-50s, fine	2 45	—2 55
2-60s, fine	2 90	—3 00
2-70s, Australian	3 45	—3 55

French System

20s, quarter	1 50	—1 60
20s, high quarter	1 60	—1 70
20s, ⅜ blood	1 75	—1 85
30s, ⅜ blood	1 85	—1 95
30s, ½ blood	2 15	—2 20
40s, ½ blood	2 30	—2 40
50s	2 50	—2 60

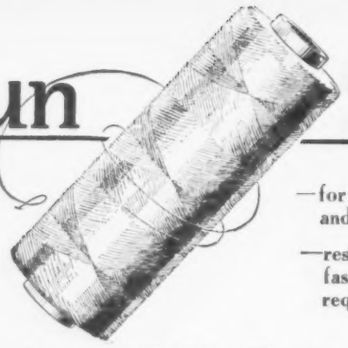
Knitting Yarns in Oil (Bradford)

2-20s, low ¼ blood	1 20	—1 25
2-18s to 2-20s, ¼ blood	1 45	—1 55
2-26s, ¼ blood	1 50	—1 60
2-30s, ¼ blood	1 55	—1 65
2-20s, ⅜ blood	1 65	—1 75
2-20s, ½ blood	2 25	

French Spun Merino, White

20s, 50-50	1 70	—1 80
30s, 60-40	1 80	—1 90
36s, 70-30	1 90	—2 00
30s, 80-20	2 00	—2 10

Spun Silk



—prompt service, Careful attention

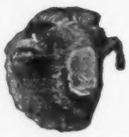
—for decorating worsteds and woolens.

—resist colors and extra fast shades for special requirements.

American Silk Spinning Co.

Providence, R. I. One Madison Ave., New York

Woolen and Merino Yarns



WEAVING KNITTING

Manufacturers Since 1864

JONATHAN RING & SON, Inc.

PHILADELPHIA, PA.

D. GOFF & SONS, Inc.

Pawtucket, R. I.

Worsted Yarns

Bradford System

OSCAR HEINEMAN CORPORATION

RAW & THROWN SILK

CHICAGO

WORSTED AND MERINO

J&D FRENCH SPUN YARNS

FOR KNITTING AND WEAVING

Manufactured by

JULES DESURMONT WORSTED CO.

WOONSOCKET, R.I.

PHILADELPHIA PROVIDENCE BOSTON

THOMAS H. BALL

SELLING AGENT

NEW YORK MILWAUKEE CLEVELAND

Announcing a

Brand New 5 to 10 in. Roll for Wet Service—*It's called*

The "All-Steel-Cap" Roll

(PATENTS PENDING)

Note the strong pressed steel cap that seals the end wood.

Let us tell you how it cuts Roll costs in two

RODNEY HUNT MACHINE COMPANY

66 Maple Street *Roll Department* Orange, Mass.

Ludwig Littauer & Co., Inc.

THROWN SILK, Tram, Organzine, Artificial Silk YARNS

Domestic and Imported, Plain, Gassed and Mercerized, Polished and Turkey Red Cotton.

Tinsel Thread

Best Quality Harness Twine

30-38 East 33rd St. New York

Silk Throwing Mills

CARTHAGE, BEACON and YONKERS, N. Y.

O. J. CARON

166 W. JACKSON BLVD.

CHICAGO, ILL.

KNITTING YARNS

Worsted and Worsted Merino

Gray Bleached Colors Heathers

L. T. IVES CO.

Established 1874 Mfgrs. of all kinds of

Spring Knitting Needles

SLIDES, SINKERS, JACKS, ETC.

NEW BRUNSWICK, N. J.

ART SILK TOPS and NOILS

Recognized as the standard by spinners of Quality

S. FEATHER CO.

110-16 Erie St., Camden, N. J.

WILLIAM RYLE & CO.

381 Fourth Ave. New York

Cor. 27th Street

Thrown Silk Yarns

For Silk, Woolen, Worsted Cotton and Knitting Mills

Rockwell Woolen Co.

Leominster, Mass.

Manufacturers of

WOOLEN and MERINO YARNS

FOR WEAVING and KNITTING

Heather a Specialty Mixtures and Decorative Yarns

WEIMAR BROTHERS

Manufacturers of

TAPES, BINDINGS AND NARROW FABRICS

2046-48 Amber Street, Philadelphia

Star Worsted Company

YARNS

FITCHBURG MASS.

WM. H. RICHARDSON QUALITY WORSTED YARNS SERVICE

Worsted Yarn Markets—Continued

this week but are still on the average below level of this time last year. The most active commodities in the noil market at the present time are mohairs. There is a distinct shortage of these commodities owing to the fact that two of the largest producers have only been working eight days per month for some time past. In wool noils the situation is unchanged. Stocks are much smaller than they were a year ago and there is no increase in worsted manufacturing activity; while on the other hand woolen manufacturing seems to be maintaining itself very well with a promise of substantial increase at the heavy-weight opening. Boston has approximately 1,000,000 less noils than a year ago. Comparison in pounds is as follows:

	1921	1922	1923
Domestic	669,744	1,728,591	814,114
Foreign	206,516	548,504	460,605

Current Quotations

	Tops	Noils
Fine territory	$1.75-1.77	85-89c
Half-blood	1.60-1.62	82-84c
High three-eighths blood	1.42-1.45	73-77c
Aver. three-eighths blood	1.37-1.40	71-73c
Low three-eighths blood	1.25-1.30	65-70c
High quarter blood	1.15-1.20	60-65c
46s	1.00-1.02	55-59c
44s	90- 92	53-56c
46	86- 87	50-52c
36s N. Z.	85- 87	47-49c

Worsted Yarn Trade Note

Thomas H. Ball announce that after Feb. 1, their Philadelphia office will be located in the Jefferson Building, 1015 Chestnut St., instead of 15 S. Third St., where they have been for many years. The New York office of this concern will also move to larger quarters at that time, situated in the Metropolitan Building, 23rd St. and Madison Ave., from their present location at 257 Fourth Ave.

Spun Silk Easy

Foreign Competition is Hurting Spun Silk Sales

There was little doing in the spun silk markets during the week. Only a small amount of new business was placed which was largely for immediate deliveries. Billings hold up fairly well because of the business taken in November and December, but new business is nearly impossible in view of the low prices being quoted on schappe for spring deliveries. Prices are as follows:

60-2	$6 10	30-2	$5 70
36-2	5 96	20-2	5 35
40-2	5 85	60-1	5 10

Art Silk Quiet

Little Doing in Market But Prices are Unchanged

Most of the leading producers and dealers reported the market as quiet during the week. Broad silk manufacturers are taking goods in fairly large quantities, but other classes of users are not doing much. The knitwear trade whose season should be opening up soon are still holding off on their material requirements. Hosiery manufacturers are likewise putting off buying because of the uncertain outlook for the next few months. Prices are as follows:

300 DENIER	
Grade A—Bleached	$2 65
Grade B—Bleached	2 35
Grade C—Bleached	2 05
150 DENIER	
Grade A—Bleached	2 80
Grade B—Bleached	2 40
Grade C—Bleached	2 05

Ask Excise Tax Repeal

WASHINGTON, D. C.—Repeal of the excise tax on carpets and rugs and on hunting and shooting garments, riding habits and liveries was urged upon the Ways and Means Committee last week. Carey B. Quinn, of Boston, representing the International Association of Garment Manufacturers, declared that the 10% tax was a nuisance, the equitable collection of which was practically impossible, and that it was unproductive, having returned to the Government last year only $168,000. Giles Whiting, of New York, treasurer of the Carpet Manufacturers Association, advocated the repeal of the 5% tax on carpets costing more than $4.50 per sq. yd. and on rugs more than $6 per sq. yd. This tax is discriminatory against the floor covering industry as, he explained, carpets and rugs subject to tax are used in conjunction with tapestries, hangings, and upholstered furniture that bear no tax. Mr. Quinn said that the majority of the carpet and rug manufacturers probably would favor a sales tax if imposed upon all commodities. He expressed no doubt that they would prefer it instead of the income tax.

Lancaster Plant Council

*CLINTON, MASS.—The 34 members of the new plant council at the Lancaster Mills have been elected by the employes and will meet shortly to elect a committee to confer with the management and work out a tentative plan for employe representation which will be reported to the council and management. Five members of the council have been employed in the mills more than 30 years, while one, a woman, has been employed but a year and a half. Following the election the plant council will select from among its members, representatives to serve on a committee to work out with the management a tentative plan for employee representation and later report its findings to the council and the management.

Tests for Oils

(*Continued from page 39*)

with a drop or two of 0.01 normal acid.

If it is necessary to distinguish mineral acids from fatty acids in an oil, a solution of methyl orange indicating solution may be used. It is turned pink by mineral acids such as sulphuric acid, but is not affected by fatty acids. Methyl orange indicator can be prepared as follows: Dissolve one gram of methyl orange in distilled water and dilute with one liter.

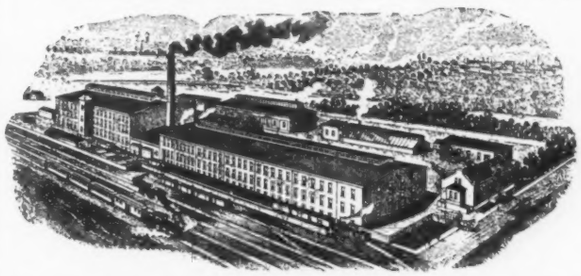
2. For determining the lubricating value of machine oils there are special types of apparatus used and most engineering colleges and some of the large industrial testing laboratories are equipped for such testing.

Pocasset Worsted Company, Inc.

Worsted Yarns

Office and Mills *Thornton, R. I.*

MERION WORSTED MILLS



Sell Direct

Fine French-Spun Worsted and Worsted Merino Yarns

WHITE NATURAL AND FANCY MIXES IN SINGLE AND PLY FOR KNITTING AND WEAVING

Mill and Office WEST CONSHOHOCKEN, PA.

Hosey Worsted Co.

WORSTED YARNS

for Knitting and Weaving Trade

BRIDGEPORT, MONT. CO. PENNA.

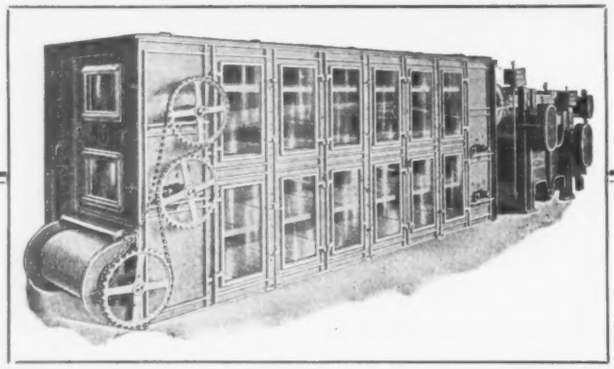
87 YEARS OF MANUFACTURING

means that

THE EATON RAPIDS WOOLEN MILLS EATON RAPIDS, MICHIGAN

Have attained the highest degree of perfection in the production of Woolen Yarns for the knitting and weaving trade.

FOUNDED 1836



The Sargent Backwasher and Backwash Dryer

For Obtaining Clean Card Sliver

The Sargent Backwasher appeals to mill men who realize the value of *clean* wool in producing the best worsteds.

Its many practical improvements (evolved by Sargent engineers) make it the most up-to-date method of washing carded wool sliver, and just the machine in the dye house for washing Vigoureux and dyed tops.

THE SARGENT BACKWASH DRYER cannot injure the sliver. The old tendency toward harshness in backwash drying is disappearing.

This machine gives the sliver the same care that is given the scoured wool in the first place.

The Sargent Backwash Dryer allows of perfect temperature and moisture control. There are no heated cylinders—currents of heated air—not metal contact dry the sliver.

The illustration shows the two machines in combination, although the Backwash Dryer may be used with any make Backwasher in connection with card sliver or dyed top.

Send for further information

C. G. SARGENT'S SONS CORP. Graniteville, Mass.

Seventy-four years of Brush Making

¶ Seventy-four years of successful manufacturing in any line is a pretty good assurance of a meritorious product.

¶ Since 1849 we have been manufacturing mill and machine brushes for every textile requirement.

¶ And this record is but the foundation upon which we plan to build an even more successful future.

¶ But doesn't it warrant your investigating right now the reason for this long continued and constantly increasing popularity of Mason Brushes?

¶ A trial order will tell the story.

MASON BRUSH WORKS

CHAS. A. O'NEIL, Agent and Mgr.

WORCESTER, MASS

Philadelphia Wool Scouring and Carbonizing Co.

WOOL

Scoured and Carbonized

Freight Address: Coral St. Sta., P. & R. R. R. Somerset and Trenton Ave., Phila., Pa.

Farnsworth, Stevenson & Co.

Established 1848

WOOL MERCHANTS

Wools and Noils of all descriptions bought and sold on commission

Consignments solicited

268-272 Summer Street, Boston, Mass.

FRANCIS WILLEY & CO., INC.

WOOL MERCHANTS **TOP MAKERS**

Summer St., BOSTON 10 Chestnut St., PHILADELPHIA

Agents for Francis Willey & Co., Bradford, England

JAY EM BEE **SPOOLS** ARE GUARANTEED

For All Shipping and Packing Purposes

J. MORRIS BROWN

606 Lexington Ave., PHILA

BRADFORD OILS For Wool and Reworked Wool

BRADFORD OIL COMPANY Inc.

PALMER, MASS.

AMTEX TRADE MARK REGISTERED **Spinning and Twisting Tapes and Double Loop Bands**

AMERICAN TEXTILE BANDING CO., Inc., Germantown, Philadelphia

THE "MURDOCK"

Keep Your Spindles fully equipped with the

Murdock Bobbin Holders

in the perfection of your goods

Murdock & Geb Co., FRANKLIN MASS.

Chicago Wool Company

SCOURED WOOL

200 Summer Street - Boston

18 W. Austin Avenue - Chicago

140 S. Front Street - Philadelphia

SHIRLEY MILLS

SHIRLEY, MASS.

Manufacturers of

REWORKED WOOL

Also Custom Carbonizing and Picking

Sales Office: Boston, Mass.

(Chelsea Station)

Telephone Main 3593 Established 1854

CROSBY & GREGORY

HEARD, SMITH & TENNANT

PATENTS

Old South Building Boston

Patents and Patent Causes Trade Marks: Copyrights

Special Attention to Textile Invention

Hallowell, Jones & Donald

FOREIGN **WOOL** DOMESTIC

252 Summer Street : BOSTON

MEDART means EVERYTHING in

Line Shafting Equipment

THE MEDART COMPANY

(Formerly Medart Patent Pulley Co.)

General Office and Works, St. Louis, U. S. A.

Offices in Chicago, Philadelphia, Pittsburgh and New York

Office and Warehouse in Cincinnati.

OLIVER L. BALLARD

Boiler Room Engineering & Contracting

Dismantle and Remodel your Boiler Room. Increase the efficiency from 30% to 50% depends on your condition.

Rigging, Erecting, Furnace Work Specialty

35 Years' Experience all kinds of Boilers

P. O. Box 154, Charlotte, N. C.

WOOL MARKETS

Unusual Situation on Summer Street

Mills Buying Higher Abroad Than at Home—Trade Cautious Though Confident

BOSTON.—Awaiting the advent of the heavy-weight opening Summer Street continues strong with an upward tendency in all grades. The year 1923 was on the whole a better year for wool growers than for wool dealers. Quite a little buying last spring was on too high a level to allow of a reasonable profit owing to the decline in wool purchasing, accompanied by a gradual fall in prices, which set up at the close of the first quarter of the year and continued right up until the closing month of 1923. It is said by some in close touch with the western wool situation that there is likely to be a wild opening for early wools and that prices now being asked for old clip wools will then look dirt cheap.

Territory wools from three-eighths blood to fine are about the cheapest wools at the present time and ought to enhance further in value in view of the strong markets abroad. According to a past president of the wool association there is no cheap wool in sight for months to come and this opinion is held by the trade.

The general indifference of manufacturers to wool purchasing in foreign and domestic markets over the last month or two reflects quite accurately their inability to size up the situation from the standpoint of the probable response of the goods market to the fall opening. Generally unseasonable weather and the slogan of a $35 suit are not exactly bullish factors. There may also have been some over-production, wool consumption for 1922 and 1923 being large, approximately 750,000,000 lbs. each year. Manufacturers may have larger wool holdings than is generally supposed by the trade, but they are not likely to have wool, spot and to arrive, much in excess of a three months supply it is said. Recent buying in Australia at high prices seems to suggest, however, the necessity they are facing of securing for later delivery a reasonable supply of good merinos.

Receipts and Shipments

Receipts of wool in lbs. for the week up to Wednesday follow:

	1924.	1923.
Domestic	1,653,700	1,471,500
Foreign	3,554,200	5,452,900
Total	5,207,900	6,924,400

Receipts of wool in lbs. since Jan. 1, 1924, compared with the same period in 1923, are as follows:

	1924.	1923.
Domestic	4,481,300	3,616,000
Foreign	7,807,300	16,642,800
Total	12,288,600	20,258,800

AUSTRALASIA SETS WOOL PRICES

Prices at London opening this week, following strong advances in Liverpool brought that market to a parity both in merinos and crossbreds with high level sustained in Australasia. Boston is still the cheapest market for merinos but manufacturers' buying has centered upon the primary markets where longer credits are available. Under these circumstances Summer Street does not care to carry high-priced wools for manufacturers and so is doing little or nothing on its own account. It is said that manufacturers have overstayed their market in Austalia and South America and that the only chance they now have is to purchase limited quantities at high prices. The fall in British exchange to $4.21-22 is a favorable factor making a difference of 2-3c. a clean pound in merinos. Low crossbreds are distinctly stronger and tops 36-40s are in good demand from manufacturers of astrachans and other artificial fur fabrics. Buenos Aires 5s have sold in Boston recently at 28c.

Shipments of wool for the week ending and including Jan. 23 follow:

Boston & Maine	2,016,000
Mystic	.....
By sea	.....
Boston & Albany	824,000
New Haven	1,728,000
Total	4,568,000
Shipments during previous week	4,732,000
Shipments same week last year	2,441,000
Shipments thus far for 1924	13,966,000
Shipments similar date 1923	5,732,000

Boston Wool Trade Notes

One of the institutions of Summer St., is the wool trade card issued annually by F. Nathaniel Perkins, dealer in foreign and domestic wools, 263 Summer St. The members of the Boston wool trade are listed alphabetically with street address and 'phone number. The directory carries 288 names this year as compared with 265 last year. On the back of the card is Wool Schedule II of the Fordney-McCumber Tariff Bill.

Conrad Hobbs, of Hobbs, Tait & Co., Inc., 419 Summer St., sailed recently accompanied by Mrs. Hobbs on the Steamship Orca, on a West Indian cruise. Samuel C. Murfitt, and Mrs. Murfitt, were also on the same boat.

Harry Holland, top maker of 184 Summer St., returned recently from his trip to Bradford, England, accompanied b yhis father, who is a well-known figure in the Bradford top trade.

Spotty Wool Demand

Medium Grades Active—Prices Rising—Scoured Interest

PHILADELPHIA.—Following the trend of foreign markets wools, particularly medium grades, have become firmer during the week, quarter blood Ohio selling at 53c, which is the highest figure reached in sales reported up to this time. Fine wools are without noticeable improvement, being held on a basis of $1.35 to $1.40 for fine staple territory; $1.20 to $1.25 for half blood; $1.10 to $1.15 for three-eighths and 90 to 95c for quarter blood. Manufacturers however will not pay 95c for quarters unless they run on the fine side. Scoured wools have experienced a good movement during the week. Pulled wools are in active request. Pullers ask prices for current pullings which dealers find difficult to secure from manufacturers. Carpet wools show a slight improvement, with prices having a tendency to go higher in sympathy with continual increases in China and East India sales.

Fleece Wools Fair

A fair business in fleece wools has been done. The outstanding feature being the sale of quarter blood at 53c It is not thought the market has reached this level as the lot in question was taken by a factor who had sold top on which quick delivery was necessary, making an immediate purchase of this particular wool imperative. Half blood staple was sold at 55c.; Missouri quarter blood at 51c. and three-eighths Ohio at 54 to 56c. It is no longer a question of being able to sell such wools, but how high a price you might secure by waiting a short time. While sales of fine Ohio delaine have been reported at 56c., the highest paid in this market is 55c. up to this time.

Territory fine staple can be sold in good quantities less than $1.35. Above this manufacturers say they cannot go and sell their yarns or goods at prices now obtainable. Dealers refuse less than this figure, many asking $1.40. Demand for fine wools is relatively unimportant at present in comparison with low wools. Fine to fine medium territory wools sold this week at $1.30. Sales usually average 25,000 lbs., showing buyers generally are pursuing a conservative course.

Western Wools Sold

B Scoured Said to Have Ranged From 85 to 90c.

CHICAGO.—A decided movement has taken place in Western B scoured wools and some people estimate a thousand bags or more changed hands. Prices were confidential but it is said the range was 85 to 90c. Other grades of scoured wools have by no means been neglected and trading took place in A wools at 95c. to $1.05 per lb. 70c. per lb. seems to be about the going price for gray wools.

Some parties claim a shortage may soon exist in certain selections of scoured wools.

Quotations

(Corrected at close of business Wednesday)

Ohio, Pennsylvania and West Virginia

Fine clothing	.42—43	⅝ blood	.55—56
Fine delaine	.55—56	¼ blood	.52—53
½ blood	.55—56		

Michigan and New York

Fine delaine	.53—55	½ blood	.52—54
Fine clothing	.47—48	¾ to ⅝ blood	.51—53

Indiana, Missouri and Similar

½ blood	.53—54	¼ blood	.49—51
⅜ blood	.52—54	Common	.39—40

California
(Scoured Basis.)

Northern		Southern	
12mo	1.25—1.28	12mo	1.05—1.10
Sp'g middle counties	1.10—1.15	Fall free	1.00—1.05
		Fall defects	.95—1.00
		Carbonized	1.00—1.10

Texas
(Scoured Basis.)

Fine 12mo	1.30—1.35	Fine fall	1.10—1.26
Fine 8mo	1.15—1.20		

Pulled—Eastern
(Scoured Basis.)

Fine	1.28—1.32	Lambs Pr.	.80— .81
A Super	1.15—1.20	C'bgs fine	1.10—1.15
B Super	.95—1.00	Medium	.90— .95
C Super	.75— .77	Course	.70— .75

Montana, Idaho and Wyoming
(Scoured Basis.)

Staple fine	1.37—1.40	Fine & fine med. clothing	1.22—1.24
Do. ½ bld	1.25—1.28		

Utah
(Scoured Basis.)

Fine	1.32—1.30	Fine med.	1.15—1.20

Colorado and New Mexico
(Scoured Basis.)

Fine	1.17—1.20	½ blood	1.10—1.15
⅜ blood	..—1.00		

Nevada
(Scoured Basis.)

Fine	1.25—1.27	Fine clothing	1.15—1.20

Mohair

Domestic		Foreign (In Bond)	
Best combing	.79—82	Turkey	.40—45
Best carding	.70—75	Cape	.35—40

Foreign Clothing and Combing
(In Bond.)

Secured Basis—		Grease Basis—	
Cape:		Montevideo:	
Combing, choice	1.19—1.31	56-58s	.54—55
Combing, Good	1.14—1.16	56s	.50-51
Clothing choice	.93— .95	50s	.43—44
Clothing good	.88— .90	Buenos Aires:	
Australian:		46s	.33—35
70s	1.23—1.27	40s	.26—27
56-58s	.93—1.06		

Foreign—Carpet
(Grease Basis—In Bond.)

Aleppo:		Khorassan:	
Washed	.32—35	1st clip	.27—29
Angora	.18—20	2d clip	.26—27
Awassl:		Mongolian:	
Washed	.28—30	Urga	.28—30
Karadi:		Manchurian	.18—21
Washed	.28—30	Scotch Black Face	22—23
China:		Servian skin wool	25—28
Combing	.24—25	East India:	
No. 1 Wild ball	.38—40	Kandahar	.32—35
Wid. filling	.24—25	Vickan'r	.33—46
Sechuen ass'm	.22—23	Joria	.43—48
Cordova	.23—33	Camel's Hair (Russian)	

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RAGS, SUBSTITUTES AND WASTE

Fibres and Rags Moving Upwards

Softs and Cloth at Highest Prices for Months—White Lap Waste Strong

The recovered wool industry is doing fairly well and it is said that a number of mills expect to buy in the near future but are holding off at the moment to wait for more definite information regarding the season's prospects that will be afforded by the end of the month by the showing of the heavy-weight fabrics for the fall season of 1924. It is evident that dark-colored materials are doing better and there is considerable processing of dark sweater stocks and worsteds, clips, as well as rag, some of the worsted clips being re-dyed to fast shades.

The rag market is doing much better, encountering, as it is, a broader demand. It is not so necessary as it was to carry large quantities of dark materials for which there was no manufacturing demand. The situation on the whole is much more promising if manufacturing conditions in some of the largest reworked wool plants in the country are to be understood as forecasting in general the future for the next few months. Mixed softs have now broken through 9c. and rough cloth is quoted better than 2c. a pound. Rag imports are beginning to show an increase, no less than 643 bales arriving recently and 64 bales of clips.

Waste Contracts Completed

Wool wastes are firm but mill purchasing is slow. Traders are looking around for cheap parcels of wastes and are finding considerable difficulty in uncovering such commodities. Prices all along the line are unchanged with a slightly upward tendency manifested which is expected to become actual when mill buying appears. Contracting for mill wastes for the year 1924 is now completed. Some houses which have handled the wastes of certain mills for several years have been cut out this year by higher bids than their own. As a case in point, fine white lap drawing may be mentioned. A year ago $1.15 secured the contract; this year a bid of $1.22-27 failed to secure this material. Choice white lap drawing is quoted $1.35.

Wool wastes since the first of the year have enjoyed a fairly substantial business, with the demand veering somewhat from fine garnets to medium threads. Good-sized quantities of fine garnets are held in stock but a large demand from knitting interests is anticipated in the near future and these materials ought to sell for $1.00 per lb. or better. Fine colored threads are being picked up here and there whenever offered at concessions. These commodities are relatively very cheap. Card wastes are improving slightly and the choicer grades of colored woolen cards have been traded in more actively since the first of the year.

Quotations

(Corrected at close of business Wednesday)

Wool Waste

Lap—	
Fine White	$1.33—$1.35
Fine Colored	1.10— 1.12
Medium Colored	.68— .72
Ring—	
Fine Australian	1.28— 1.30
Fine Domestic	1.22— 1.25
Thread White Worsted—	
Fine	.92— .95
½ Blood	.82— .85
¾ Blood	.72— .75
¼ Blood	.58— .60
Low	.40— .45
Thread Colored Worsted—	
Fine	.43— .48
½ Blood	.40— .45
¾ Blood	.35— .37
¼ Blood	.31— .33
Low	.28— .30
Carpet	.17— .19
Card—	
Fine White	.50— .55
Medium White	.33— .35
Fine Colored	.18— .20
Medium Colored	.08— .10

Reworked Wool

	Cents per lb.
Serges—	
Blue	20—21
Brown	26—27
Green	29—30
Red	33—34
Black	19—20
Knits—	
White	57—58
Red	43—45
Brown	28—39
Merinos—	
Fine light	37—38
Fine dark	21—22
Coarse light	21—22
Worsted Skirted—	
Light	23—24
Blue	21—22
Dark	15—16
Brown	21—22

Men's Wear Clips

Worsteds—	
Dark	15—16
Light	21—23
Brown	28—29
Blue	33—34
Black	25—28

Flannels

Blue	15—16
Black	15—16
Green	16—17
Light	19—20
Tan	22—24
Scarlet	22—24

Women's Wear Clips

Serges—	
White	50—55
Blue	25—26
Black	27—28
Brown	30—32
Green	30—31
Light	25—26
Tan	30—31

Old Woolen Rags

Merinos—	
Coarse light	7 — 8
Fine light	22 —23
Coarse dark	2½— 3
Fine dark	6 — 7
Serges—	
Light	14 —15
Brown	14 —15
Blue	7 — 8
Black	6½— 7
Red	14 —15
Green	12 —13
Knit—	
White	35 —36
Black	14 —15
Red	22 —23
Brown	18 —19
Light	23 —24

Skirted Cloths

Skirted Worsteds—	
Light	7 — 7½
Black	7 — 7½
Blue	6 — 7
Dark	3 — 4

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FOR COTTON

NATIONAL U.S.A. DYES

DYESTUFFS AND CHEMICALS

Textile Chemicals Slightly Firmer

Potash and Soda Compounds More Active—Permanganate a Weak Feature

The general list of chemicals finding utilization in the textile industry show more activity this week at slightly better prices. Advances are more numerous than declines and the index figure covering 25 representative chemicals is up approximately 1% for the week. Among the textile chemicals showing an advance are potash carbonate as well as the caustic, potash bichromate, soda sulphide, formic acid and tartaric acid. Declines are noted in the prussiates of potash, soda hydrosulphite and permanganate of potash. This latter commodity is the weakest on the list. Domestic producers are cutting prices to meet competition from imports. It is now quoted 14-15c. as compared with 15c. at the beginning of 1923, 12c. in 1922 and 70c. in 1921. During the war it sold as high as $6.00 per lb.

Bleach Improves

The situation in bleaching materials and alkalies shows improvement. The firmer attitude is evident in prices maintaining their recent advances. Bleaching powder is steady at 1½c. and liquid chlorine in cylinders is firm at 4½c. Contract business in soda ash is good and it is said that approximately 90% of last year's deliveries are already on the books for this year. Light ash, basis 58%, is quoted $1.25, in bags, $1.38, and in barrels, $1.63. Contract price for solid caustic, basis 76% is $3.10 per 100 lbs. in carload lots at works. The mineral acid group holds fairly firm with nitric acid 36-degree at 4½c, the same price as a year ago but comparable with 5½c. at the beginning of 1922 and 6¼c. at the beginning of 1921. Sulphuric acid 66-degree is firm at $15 per ton as compared with $14.50 a year ago, $17 in 1922, and $21 in 1921. The organic acids are rather inactive with competition from imported materials less evident.

In fats, oils and greases there is a slightly improved demand, Turkey red oil alone showing a decline for the week of ½c. per lb. in the 60% material. Red oil, whether distilled or saponified, sells between 8 and 9c. depending upon quantities purchased. Denatured olive is quoted $1.10-20 in stock barrels. Palm oil is in more active demand, Lagos selling in bulk fractionally under 8c. The prospect for soaps seems better as the processing and finishing end of the cotton industry is showing some little revival.

Miscellaneous Chemicals

Acetone	25	—	26
Alumina-Sulphate Com.	1½	—	1¾
Iron Free	2½	—	..
Alum. Ammonia Lump	3½	—	3¾
Potash, Lump	2¾	—	4
Ammoniac, Sal. white gr.	6½	—	3
Bleach powder, per 100 lb. works, drums	1.50	—	1.90
Blue stone	4¾	—	5
Calcium Arsenate	13	—	15
Chlorine, Liquid Cylinders	4½	—	6
Tanks	3½	—	..
Copperas, ton	18 00	—	25 00
Cream of Tartar, tech	23	—	25½
Epsom Salts, Tech, 100 lb.	1 10	—	1 75
Formaldehyde Spot	11	—	11½
Glauber Salts, 100 lb.	90	—	1 35
Glycerine (C. P.) bbls., dms., extra	16½	—	17
Cans	17½	—	18
Yellow Crude	15½	—	16
Hydrosulphite Conc.	24	—	26
Lead—Brown acetate	13	—	13½
White (crystals)	14	—	14½
Lime, acetate, 100 lb.	4 00	—	..
Potassium—Bichromate	9¾	—	..
Chlorate crystals	7½	—	9
Permanganate, tech.	14	—	15
Sodium acetate	5	—	5½
Bichromate	7¼	—	8
Bisulphite, 35%	1½	—	..
Nitrite	8	—	8½
Phosphate (Commercial)	3½	—	4
Prussiate, yellow	12	—	13½
Sulphide, 60% fused	3	—	5
30% crystals	2	—	2½
Tartar, emetic, tech	28	—	30
Tin—Crystals	34½	—	35
Bichloride, 50 deg.	13½	—	14
Oxide, lb.	51	—	53
Zinc Dust	11	—	12

Acids

Acetic, 28% per 100 lb.	3 38	—	3 63
Citric crystals	47	—	49
Formic, 85%	14	—	16
Lactic, 22%	4½	—	6½
Muriatic, 18 deg. per 100 lb., in tank cars	90	—	1 00
Nitric, 36 @ 42 deg. per 100 lb	4 50	—	6 00
Oxalic	11½	—	12
Sulphuric, 66 deg. per ton, in tank cars	15 00	—	16 00
Tartaric	27	—	30

Alkalies

Ammonia, aqua, 26 deg.	7	—	7½
Borax, refined, crystals and powdered, bbls.	5½	—	6½
Potash, carbonate, 80-85%	5½	—	6
Caustic, 88-92%	6½	—	7
Soda Ash, 58% light, Contract, bulk, 100 lb.	1 25	—	..
Contract, bags, 100 lb.	1 38	—	..
Contract, bbls., 100 lb.	1 63	—	..
Spot, 100 lb. bags	2 00	—	2 20
Bicarbonate, per 100 lb.	2 00	—	2 25
Caustic, 76%, per 100 lb. spot	3 75	—	3 90
Contract, 100 lb.	3 10	—	..
Sal., 100 lb.	1 15	—	125

Natural Dyes and Tannins

Fustic: Solid	14	—	15
Liquid, 51 deg.	10	—	12
Gambier, liquid	9	—	10
Hematine, Crystals	14	—	20
Hypernic Ext.—51 deg., red shade	9	—	10
Indigo—Madras	95	—	1 00
Logwood chips	2½	—	3½
Extract, liquid, 51 deg.	7	—	8
Crystals	14	—	16
Osage Orange, Extract, 51 degs.	7	—	7½
Osage Orange crystals	16	—	17
Quercitron, Extract, 51 degs.	6½	—	7½
Sumac, Ext. dom., ref., 51 degs.	6½	—	7
Extract, stainless	9	—	10
Tannic acid, technical	40	—	45

Dyestuffs Intermediates

Alpha Naphthol, ref.	65	—	90
Crude	60	—	80
Alpha Naphthylamine	35	—	37
Aniline Oil	16	—	17½
Salt	23	—	25
Beta Naphthol, sublimed	55	—	60
Technical	25	—	27
Dimethylaniline	40	—	41
Metaphenylene Diamine	90	—	95
Paranitraniline	70	—	72

Oils and Soaps

Castor Oil, No. 3	14½	—	15½
Olive Oil, denatured, gal.	1 15	—	1 20
Foots	..	—	..
Red oil, lb.	8¼	—	9
Stearic Acid, double pressed	11½	—	..
Turkey Red Oil, 50%	9	—	10½

Adhesive and Sizing Materials

Albumin, blood domestic	50	—	60
Egg, technical	..	—	..
Dextrine—Potato	7½	—	8
Corn, carload lots, bags, 100 lb.	3 54	—	3 59
Do., bbls., 100 lb.	3 81	—	3 86
Gum arabic, amber sorts	12	—	12½
Gum, British, carload lots, bags, 100 lb.	2 89	—	..
Do., bbls., 100 lb.	4 16	—	..
Sago, flour	3½	—	4
Starch, corn, bags, carload, 100 lb.	2 97	—	3 07
Do., bbls.	3 24	—	3 34
Corn, thin boiling, bags, 100 lb.	3 72	—	3 82
Do., bbls.	3 99	—	4 09
Potato	4½	—	5½
Rice	9	—	12
Wheat	6	—	7
Tapioca flour	5½	—	6

Coal Tar Dyes

Direct Colors—			
Black (H-acid)	35	—	40
Black, Columbia FF	80	—	1 00
Blue, 2 B.	29	—	45
Blue, 3 B.	50	—	75
Blue, sky, ordinary	80	—	1 15
Blue, sky, FF	1 15	—	2 20
Blue, Fast RL	1 80	—	..
Blue, Solamine	2 00	—	..
Benzo Azurine	80	—	90
Brown C	40	—	70
Brown M	70	—	90
Brown, Congo G	90	—	..
Brown, Congo R	85	—	..
Green B	90	—	1 10
Green G	90	—	1 10
Orange, Congo	80	—	..
Orange, Fast S	1 95	—	..
Red, Fast F	90	—	1 10
Red, Congo	45	—	70
Red, Benzo Purpurine 4 B.	45	—	90
Red, Benzo Purpurine 10 B.	2 00	—	..
Scarlet, 4 DA	1 50	—	..
Scarlet, 4 BS	2 50	—	..
Scarlet, 8 BS	2 15	—	..
Scarlet, Diamine B	1 65	—	..
Violet N	1 10	—	1 40
Yellow, Chloramine	1 00	—	2 00
Yellow, Chrysamine	90	—	1 25
Yellow, Chrysophenine	80	—	2 50
Yellow, Stilbene	90	—	1 25
Developing Colors—			
Black, B. H.	75	—	1 10
Black, Zambesi	3 50	—	..
Orange, developed	2 50	—	..
Primuline	1 00	—	1 15
Scarlet, Developed A	2 50	—	..
Scarlet, Developed R	3 00	—	..
Diazo Bordeaux 7 B.	2 00	—	..
Sulphur Colors—			
Black	15	—	30
Blue, cadet	80	—	95
Blue, navy	50	—	90
Brown	25	—	60
Green	85	—	1 25
Green, olive	55	—	80
Yellow	45	—	1 80
Basic Colors—			
Auramine	1 50	—	2 50
Bismarck Brown	60	—	75
Chrysoidine	65	—	80
Fuchsine crystals	2 25	—	2 75
Malachite green	1 70	—	2 25
Methylene blue	1 65	—	2 00
Methyl violet	1 50	—	1 60
Rhodamine B, ex. conc.	8 00	—	..
Rhodamine 6 G	12 00	—	18 00
Safranine	1 60	—	2 00
Victoria Blue B	2 00	—	3 00
Acid Colors—			
Naphthol blue black	60	—	80
Naphthylamine black 4 B.	50	—	75
Sulphon black A	1 10	—	..
Alizarine saphirol	3 50	—	4 00
Alkali blue	3 50	—	4 50
Indigotine	1 75	—	2 50
Induline (water soluble)	75	—	85
Soluble Blue	2 75	—	3 50
Sulphocyanine	85	—	1 00
Sulphon Blue R	70	—	90
Patent Blue A	2 85	—	..
Resorcin brown	95	—	95
Guinea green	1 00	—	2 20
Wool green S	65	—	2 30
Orange II	29	—	33
Orange GG (crystals)	60	—	..
Acid fuchsine	75	—	..
Amaranth	50	—	..
Azo Bordeaux	75	—	1 00
Azo eosine G	1 25	—	2 25
Brilliant scarlet	85	—	95
Crocein scarlet	1 10	—	1 35
Fast red A	60	—	70
Azo yellow	1 10	—	1 40
Fast Light Yellow 2 G	2 00	—	..
Fast Light Yellow 3 G	2 75	—	..
Naphthol Yellow	1 35	—	1 40
Metanil Yellow	80	—	1 10
Indigo—			
Synthetic, 20% paste	26	—	26½
Contracts	25	—	25½

Dyes and Dyestuffs Moving Slowly

Market Awaiting Developments in Wool and Cotton Manufacturing

A slight improvement is noted in the domestic demand for coal tar crudes and intermediates but export business is very little better although manufacturers feel that so far as Japan is concerned German competition is not likely to be effective as against American producers. Phenol is the strong spot in the market and benzol has been doing better, a larger demand reducing stocks in recent weeks. Anthracene is quite inactive. The entire line of coal tar acids and intermediates is well below last year's price level at this time. They are apparently awaiting a much better demand for the finished dyestuffs as well as an improvement in the export situation.

The industry for finished colors is awaiting improved textile demand which is to be expected in the not far distant future unless cotton and wool manufacturing should have a very abnormal year. The many difficulties in the way of development of an American dye industry have now been surmounted and American manufacturers are able to compete, dye with dye, with the best makers of the world. New dyes are constantly being developed and one important concern announces the resumption of the manufacture of malachite green crystals. Dye imports are not formidable, the amount for December being 202,704 pounds as compared with a monthly average import for 1923 of 219,000 pounds, valued at approximately $1.03 per pound. In December the usual assortment of indanthrenes, helindrones and alizarines arrived, Germany being responsible for 68% of the total and Switzerland for 14%.

Natural dyestuffs are rather softer this week, a decline of $1.00 per ton in logwood and fractional declines in cutch and persian berry being recorded. The market as a whole, judged by its index figure is up 12% as compared with a year ago. The various extracts are not likely to improve much until the demand from the textile industry assumes a larger volume. Cotton printing seems to be picking up a little and demand from wool manufacturers is likely to improve on the placing of orders for fall fabrics at the close of the month.

Dye and Chemical Notes

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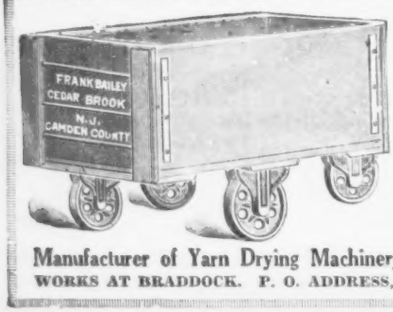

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OBITUARY

Richard Barlow

Richard Barlow, formerly agent at the Pacific Mills Print Works, Lawrence, Mass., succeeding his father who held that office for many years previously, died Jan. 21 at his home, 492 Lowell St. He retired from the textile industry several years ago, devoting his time since then to his realty holdings. Born in Lawrence 67 years ago, Mr. Barlow entered the employ of the Pacific Mill Corp. at an early age. After serving his apprenticeship, he worked in various offices at the plant until he reached the highest office when it was surrendered by his father.

George Herbert Clark

George Herbert Clark, Richmond, R. I., an organizer of the Columbia Narrow Fabrics Co., of Shamrock, R. I., died Jan. 17 at the age of 77. Mr. Clark became associated with his father in the textile business at the age of 18 years. In 1885 bought his father's old mill and started to manufacture cotton yarn. Sixteen years later, in 1901, he was active in the organizing of the Columbia Co., which business was first started at Providence, and later moved to Shamrock. The early concern was incorporated with Mr. Clark, president; and his two sons, George P. and Henry G. as treasurer and secretary, respectively.

Business News

Changes in McClave-Brooks Sales Organization

The McClave-Brooks Co., Scranton, Pa., maker of McClave grates, stokers and other combustion equipment, announces the following changes in their sales organization, to take effect Feb. 1.

The branch office in St. Paul, which has heretofore been under the supervision of the Chicago branch office, will become the Northwestern District Office. The northern half of Wisconsin and the northern peninsula of Michigan will be included in the territory of this office. L. A. Picha will be the St. Faul manager. J. C. Sanders, who has been in charge of the southern territory for the past two years, will become Manager of the Western District Office at Chicago. A. J. Frett will continue as assistant manager of the Chicago office.

B. L. Sanders will assume the managership of the Southern District Office at Greenville, S. C.

Sales in the state of Kentucky will now come under the jurisdiction of the Southwestern District Office at Memphis, where D. G. Counts is manager.

E. G. Whitmore, formerly in charge of the engineering and designing departments in the McClave-Brooks plant at Scranton, will become district sales manager of the Scranton territory, comprising all of Northeastern Pennsylvania. C. A. Warg will succeed Mr. Whitmore as manager of the Engineering and Designing Departments

Honeco Products Become Part of American Schaeffer & Budenberg Line

The American Schaeffer & Budenberg Corporation have acquired the important assets including patents, trade marks, trade names and good will, of Hohmann-Nelson Co., Eau Claire, Wis. The personnel of the Honeco organization, including A. J. Nelson and department heads, has been retained and will be strengthened by the facilities both engineering and manufacturing, of the American Schaeffer & Budenberg organization at its Brooklyn (N. Y.) plant.

The latter company feels that, in adding to its line of temperature measuring and recording instruments the Honeco line of temperature controllers, it is enabled to give more complete service to those plants wherein the study and regulation of temperature in manufacturing processes is a vital factor.

Firth-Smith Co. Add Motor Department

A textile branch of the Champion Electric Company has been established by Firth-Smith Co., 200 Devonshire St., Boston, Mass., specializing on electric motors for individual and group drives in textile mills. The Champion Electric Company have manufactured Champion Endurance Motors for many years, developing them for use on the fine line of shoe machinery which they manufacture and which calls for individual and group drives. These motors have self-cleaning and self-cooling features that are particularly desirable for textile mills. An interesting booklet giving information on the design, construction and performance of these motors has been issued.

C. Bensinger Co. Birthday

C. Bensinger Co., New York, will celebrate its 15th birthday on Feb. 15. As a matter of fact their history dates back 37 years, having been established in 1887, but it was 15 years ago that they began energetically the sale of telegraph cable codes. Prior to that time the company had been known as the manufacturer of the Bensinger Rapid Duplicator. Their business as code distributors has shown a steady growth during this 15 year period.

New Office for Chester I. Campbell

Chester I. Campbell, secretary-treasurer of the Textile Exhibitors' Association, announces the removal of his organization, after having been 23 years at 5 Park Square, Boston, Mass., to the Park Square Building in that city.

Big Chicago Wool Sale

BOSTON, MASS.—The local office of the Bureau of Markets, U. S. Department of Agriculture, reports the sale in Chicago to manufacturers of nearly 5,000,000 lbs. of consigned Montana wool at prices ranging from 51 to 52c. It is reported locally that the sale was made by the National Wool Warehouse & Storage Co.

Upsetting Precedent

Established custom and long-used methods deserve respect, but, frequently, improvements in methods or materials which make possible greater efficiency and higher quality products are overlooked.

It is significant that textile mills in increasing numbers are turning to the use of the special purpose alkalies.

Wyandotte Textile Soda
Wyandotte Concentrated Ash
Wyandotte Kier Boiling Special

This proves the claim made again and again for these special alkalies — that they do their work quicker and more easily; that they produce a softer texture; that colors come out brighter and clearer; that the better condition of the fibres gives a better quality appearance to fabrics.

You might be told many times about these facts and never be convinced. But an order on your supply house will prove their truth to your complete satisfaction.

Should the proof fail the trial will cost you nothing. Could anything be more fair to you?

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AMERICAN WOOLEN COMPANY
TRADE MARK REGISTERED U.S. PAT. OFFICE

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at lowest possible prices consistent with high grade work. With direct rail connection, sidings, mill tracks and every facility for handling material, prompt delivery is assured.

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All kinds of plain and fancy Men's Wear and Dress Goods woven on commission.

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Extra Facilities for Reeling

Cotton, Worsted, Artificial Silk

Quiller Warps—Cops—Cones—Tubes

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The TEXTILE CLEARING HOUSE

Situations Wanted

Manufacturers who are in need of superintendents or overseers for any department of mill work may learn of suitable men upon application by mail or telephone to C. T. DONLEVY, care Textile World, 111 Summer St., Boston, Mass.

SUPERINTENDENT OR OVERSEER OF WEAVING IN COTTON MILL. Position wanted by a man with wide experience on all grades of cotton goods. Worked in some of the best mills in New England. Could take position at short notice. Good recommendations.
O. B. 6835, Textile World, Boston, Mass.

ASSISTANT SUPERINTENDENT OR ASST. DESIGNER IN WOOLEN MILL. Position wanted by man 25 years of age, American, married. Worked on all classes of woolen goods. Good recommendations.
O. B. 8026, Textile World, Boston, Mass.

OVERSEER OF TWISTING, GASSING, SPOOLING, OR WINDING IN COTTON MILL. Position wanted by man 36 years of age, English, married. Worked on coarse, fine and medium counts. Familiar with all English makes of machinery; also Fales & Jenks, and Potter & Johnson. Good recommendations.
O. B. 8027, Textile World, Boston, Mass.

EXECUTIVE (AGT. OR TREAS.) OF HOSIERY PLANT, COTTON YARN OR COTTON CLOTH MILL. Position wanted by man 50 years of age. American, married. Worked on all kinds of cotton goods, hosiery and underwear. Familiar with all makes of machinery used in hosiery and cotton manufacturing. Good recommendations.
O. B. 8028, Textile World, Boston, Mass.

ASSISTANT DESIGNER IN WOOLEN OR WORSTED MILL. Position wanted by man 27 years of age, American, single. Worked on all classes of woolen and worsted goods. Good recommendations.
O. B. 8031, Textile World, Boston, Mass

OVERSEER OF FINISHING IN WOOLEN OR WORSTED MILL. Position wanted by man 33 years of age, German, married. Worked on all kinds of woolen and worsted goods, especially bolivias and pile fabrics. Familiar with all makes of finishing machinery. Good recommendations.
O. B. 8032, Textile World, Boston, Mass.

ASSISTANT DESIGNER IN WOOLEN MILL. Position wanted by man 27 years of age, American, single. Worked on satinetts, all worsteds and woolens. Familiar with all makes of machinery. Good recommendations.
O. B. 8033, Textile World, Boston, Mass.

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COTTON YARN SALESMAN

Thoroughly experienced on medium and coarse counts, plain and mercerized yarns, now open for engagement in territory around Greater New York and lower New England. Drawing account or salary basis only.

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Position Wanted as Superintendent or Asst. Superintendent

By young man 34 yrs. of age, married, 16 years woolen mill experience. Thoroughly familiar with manufacture of medium and low grade cloakings and men's wear. Experienced finisher and dyer.

Address Adv. 246 Textile World,
334 Fourth Avenue, New York.

Position Wanted

Man of 36—Single—Knowles Loom Fixer. First class Mechanic and Practical Designer on Men's wear and dress goods.

Address Adv. 247, Textile World
334 Fourth Ave., New York

FULL FASHIONED HOSIERY MAN wishes position

With reliable concern. Capable of taking full charge of hosiery plant. Thoroughly experienced on all types of machines and designing of styles.

Address Adv. 227, Textile World,
334 Fourth Avenue, New York.

BOSS SHEARER

Experienced on Plushes and Mohair design work seeks situation.

Address Adv. 220, Textile World,
334 Fourth Ave., New York.

Young Man (25 years) with a number of years experience as Assistant Designer and Superintendent in Woolens and Worsteds from Raw Stock to Finished Piece desires to make connection. PHILADELPHIA TEXTILE SCHOOL GRADUATE. References.

Address Adv. 400, Textile World
828 Drexel Bldg., Philadelphia, Pa.

Textile World

EDITORS

C. H. Clark V. E. Carroll Clarence Hutton D. G. Woolf

A TENET OF OUR CREED: WE BELIEVE IN THE CONSERVATION AND PROTECTION OF DOMESTIC INDUSTRIES.

Vol. LXV February 2, 1924 No. 5

The Textile Forecast

THOSE who may be accepted as authorities on the outlook for general business, including the leading economic research organizations, are unanimously of the opinion that good business may be looked for confidently during the first six months, at least, of 1924, and one of the latter defines the expected degree of prosperity as normal, or pre-war.

The course of trade in staple lines of textiles cannot vary widely from that of general business; therefore, despite the fact that textiles average higher in price than most other commodities as the result of high raw material prices, and despite considerable uncertainty surrounding the future course of the latter, ve forecast with considerable confidence a normal consuming demand and a widening of the present narrow, and in some cases negative, margin between the prices of raw materials and the mill prices of their manufactures.

* * *

Let the Tariff Alone!

ALTHOUGH the inadequacy of existing tariff rates upon many lines of textiles, and the unjustifiably high rates upon crossbred wools, have been noted frequently in these columns since the passage of the Fordney-McCumber law, and have been demonstrated at serious cost to domestic manufacturers during the past year, attempts to reopen the tariff question for amendment by the present Congress are to be deplored. The effect of the defects of the present law is preferable to the uncertainty that would surround tariff tinkering as long as balance of power in the Senate is controlled by a group of radicals unfriendly to adequate protection to domestic industry. It is much safer to await the result of the presidential election and the probable return by the electorate of a larger percentage of congressmen of both leading parties who can be depended upon by both industry and agriculture for constructive and sound legislation.

* * *

Employer and Employe

THE adage, "No news is good news," applies peculiarly well to the situation in employer-employe relations during the year just closed. It is encouraging to note that the tendency to regard employe service plans as new toys — heritages of the war — is disappearing and that instead the whole subject of industrial relations is being viewed in its proper light, namely, as a phase of manufacturing at least as important as the technique of production.

With this saner viewpoint has come a crystallization of thought on the problem of the real endpoint of these plans. Particularly does this apply to employe representation. Several important mills have developed varying forms but each new plan has been honestly conceived and introduced so that neither employes nor outsiders could interpret the move as a trend toward rearrangement of management responsibility. Instead, the methods are shaped toward one end — the provision of an orderly channel for mutual interchange of reactions.

* * *

A Notable Anniversary

THE twenty-fifth anniversary of the establishment of the mercerizing industry in this country on a commercial basis, that is celebrated in this issue by a review of its early history, is worthy of a more formal recognition. The reminiscences of the pioneers who courageously launched this new process, and who had placed it upon a firm footing in 1898, show that they had visualized large possibilities for themselves and the textile industry, but their vision could not encompass its present scope and importance. From 1898 to 1904 it was estimated that 34,000,000 pounds of cotton yarn had been mercerized, or an annual average of 6,800,000 pounds. In 1919, according to estimates based upon the U. S. census figures, consumption of mercerized yarns was over 50,000,000 pounds. Today the annual capacity of the largest yarn mercerizing plant in the country on a single shift basis is nearly half of the latter amount. Unfortunately no figures are available for piece mercerizing, but it aggregates hundreds of millions of yards annually and represents as broad a variety of utility as yarn mercerizing.

* * *

The Mechanical Department

A SIGNIFICANT and important development in textile mill operation is the larger part played by the mechanical department. Its status today is far different from that of a few years ago, when the engineer and master mechanic were looked upon as something apart from the manufacturing units. We now have the mechanical superintendent in charge of power and repair work, as well as many other plant activities, and, like the manufacturing superintendents, operating his department at a profit.

The heat balance of mills is scrutinized; steam and power wastes located and corrected; more economical material-handling methods adopted; better lighting of work obtained; accident and fire prevention methods improved; and solutions found to numerous problems that only wide-awake men of engineering training can handle. Other savings are resulting from substituting inspection and maintenance work for much of the old-time repair work, with its enforced idleness of machines and workers, and unbalancing of production.

The possibilities of service from the mechanical department have not been exhausted and its personnel will measure up to them in proportion to the recognition accorded by the industry. It is encouraging to note that several of the mill construction developments of 1923 included new buildings to provide adequate facilities for its equipment and activities.

Better Mill Buildings

THAT building costs are high is a fact that is immediately impressed upon anyone looking into the subject. When unit costs per square foot of building are placed against similar costs of earlier dates, the result is apt to discourage many prospective builders. It should be pointed out, however, that costs per square foot are not the only comparison that should be made. Quality of construction and building equipment are far different than were formerly used. More rigid construction is employed, allowing higher speeds and closer settings of machinery. Buildings are less liable to destruction by fire. Not only larger window areas with steel sash for natural lighting are provided, but artificial illumination is better. The heating and ventilating installations are much more efficient. All of these things contribute to better buildings, which naturally cost mone.

Some manufacturers and engineers believe that while costs have gone up, maintenance work on the type of textile mill being built today will go down, and in spite of the larger initial investment being made in building materials and equipment today, the ultimate cost per year of service will be less. Supporting this view is the fact that present costs put a premium on efficient design and the floor area may be less per unit of output, eliminating useless operating expense. The above are some reasons for the large amount of construction work done last year and planned for 1924.

* * *

Southern Diversification

THE expansion of the southern cotton manufacturing industry which has been such an important feature during the last few years continued in 1923. Particularly noteworthy was the tendency toward greater diversification, as outlined in detail elsewhere in this issue.

That such a trend is entirely natural may be appreciated after a careful consideration of the figures on geographical distribution of the textile industry. These show that a very small portion of the branches other than cotton manufacturing is located in the South. An increase in this direction is vital to the interest of southern manufacturers.

The problems which this expansion presents to New England have been sufficiently emphasized during recent years. Of equal importance, perhaps, are the problems which it brings to the South itself.

Viewed as a whole, the development can only be regarded as a favorable one. To the North, it means for a while increased competition with, however, the probability of inequalities being eliminated in the course of a few years. To the South, taken in conjunction with greater diversification of agriculture now under way, it means that the greatest period of prosperity in its history is in prospect. To the textile industry as a whole it means increased production—and the necessity of increasing the demand in proportion, either by better merchandising methods or the creation of foreign markets— or both.

Favorable Outlook For First Half of Year

Both Harvard Economic Service and the Brookmire Economic Service, Inc., Agree That Favorable Basic Factors Governing General Business Forecast Improvement During First Half of Year, With Firm or Rising Prices and Normal Production

(From Harvard Economic Service Letter of Nov. 17, 1923)

Through the courtesy of Prof. Charles J. Bullock, chairman of the Harvard University Committee on Economic Research, we are able to quote from the Harvard Economic Service Letter of Nov. 17, 1923, that contains their forecast of business conditions for the first half of 1924. Their later references to the same subject have merely strengthened views expressed somewhat tentatively Nov. 17.

ON the basis of the appraisal of business conditions presented in the following section of this *Letter*, we forecast for the first half of 1924 a firm or moderately rising price level, the maintenance of a normal manufacturing output, and the continuance of generally good business conditions. In our view, the decisive factor in the present situation is the non-appearance of stringency in the money market during and following the business recession which has taken place since last spring. There has been no forced liquidation and no freezing of bank loans such as would have occurred if serious trouble had developed or were now impending. The maintenance of satisfactory money conditions will enable business to complete the present readjustment without passing through a period of depression such as would have been indicated by a continued marked increase of interest rates, following price recessions and curtailment of business activity.

Upon the whole, in spite of little forward buying and unsatisfactory conditions in a number of important trades, business has continued active; and, as our curve B indicates, October registered an improvement over September. Manufacturing output, while below the record levels of last spring, averages above normal. In our index of the volume of manufacture the normal level is registered as 100, and this represents something like 75 to 80 per cent of capacity. Except in boom times, capacity production is never reached; and the present level of output means active business, suggesting neither a boom nor a depression. Building operations have held up remarkably well during the fall; and in October the value of building permits and of contracts awarded oshwed an advance so substantial as to indicate, maintenance of active operations during the winter. Moreover, the automobile industry, although showing the usual seasonal retardation, has found demand holding up very well; and inquiries for railroad equipment and supplies are on the increase.

Credit Situation Favorable

Not only is business not in a condition of depression, but such a development has been rendered hightly improbable by the prompt relaxation of interest rates at the end of October, once the usual seasonal needs for funds had been met. In the week ending November 2 the highest rate on commercial paper declined from 5½ to 5¼ per cent. Furthermore, stability in the money market—somewhat tempered in the direction of greater ease—promises to continue the dominant characteristic of the credit situation, at least during the early months of 1924. Any marked advance of interest rates during the next half-year can be brought about only by expansion of business and speculative activity, in volume great enough to counteract both the normal seasonal movement, which is in the direction of ease, and the favorable tendencies which have been operative in the money market since last June. In view of the conservative temper of the business community (which we believe will continue) the available credit resources seem sufficiently large to provide for such increase in the demand for accommodation as can now be foreseen. It is highly improbable, therefore, that credit shortage will hamper or restrict business activity during the first half of 1924.

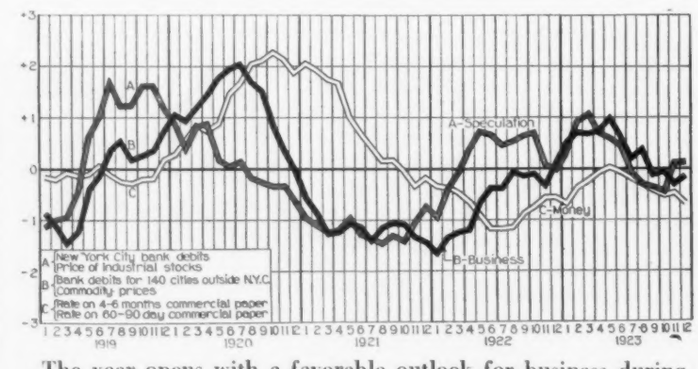
This conclusion is especially important because of the part the money curve (C) plays in the interpretation of our index chart. A downward swing of the business curve (B) into a period of depression is forecast when a sustained upward movement of the money curve (C) occurs simultaneously with a persistent decline of the speculative curve (A). This year only the movement of speculation has been such as to suggest an impending cyclical downturn of business. But this decline of speculation occurred in the face of persistent easing of the money market, when seasonal influences are allowed for, a condition registered on our index chart by the gradual decline of our money curve after May. Since not a declining stock market alone, but this condition coincident with a steadily tightening money market, constitutes the danger signal foretelling the approach of a business depression, the absence of money strain this year has forecast the stabilization of commodity markets.

No Boom, But Improved Business

We believe, then, that business will be at least reasonably good during the first half of 1924. This is as far as it is now possible to gauge the governing economic forces. It is even conceivable—though, as we now view the situation, improbable—that a more decided upturn may develop next spring, just as during the first quarter of this year. Marked expansion of building operations, increased or even sustained demand for automobiles, and further buying of railroad equipment on a considerable scale—to cite only the industries which moved ahead very rapidly in 1923—might well cause a sharp rise in materials markets, especially where stocks of materials in manufacturers' hands are now low as a result of cautious buying during the months just past. Similar conditions accounted for the sharp upturn of prices early this year, following the conservative buying of 1922, and led to the fear of inflation and to concerted action to moderate the upswing of the business cycle, which contributed to the unsettlement of business opinion six months ago.

But at present no boom is in sight, and we believe such a development unlikely. Caution arising from the experience of last spring is now added to the memories of 1920. Furthermore, the continued deadlock over reparations is likely to emphasize European unsettlement as an adverse factor in the general situation. Account must also be taken of the possible reaction of political conditions, especially the continuation of agricultural unrest, upon the attitude of business men. Finally, there is the tradition that presidential years are unfavorable for business, to which must be accorded some recognition, though the evidence is conflicting, and not enough is known about the historical facts to warrant the belief that business in such years is usually very different from business in others. In any event, political conditions are not likely to affect greatly the movement of business during the first half of 1924, and, to the extent that they reinforce caution, they are more likely to help than to harm. At this time, therefore, we forecast improvement in business during the first half of next year, with generally firm or rising commodity markets, expanding operations and activity, and a normal manufacturing output.

HARVARD ECONOMIC SERVICE INDEX CHART



The year opens with a favorable outlook for business during the first half of 1924. Comparatively easy money conditions furnish a basis upon which business expansion may take place. The maintenance of large consuming power (based on full employment and improved agricultural conditions) points to a large volume of trade. Together with recent curtailment of production in various lines of manufacture, this factor has tended recently to strengthen commodity markets.

The Future Discounted

By *George H. Hodgson**

Personally, I do not think the Presidential election this year will have very much influence on the textile business as most people have already discounted it and have come to a conclusion as to exactly what is going to happen.

The big factor which will help the textile business more than anything else is a reduction in the price of wool from its present high standard.

At this writing, this does not seem to be apparent, but I imagine this will be governed like all other commodities by the question of supply and demand and if the demand does not materialize for the wool that is already for sale, some lowering in prices must take place.

* Vice-president and general manager Cleveland (O.) Worsted Mills Co.

The Textile Trend and Forecast

BASIC conditions governing the general business forecast for the first half (at least) of 1924 prosperity of a normal or pre-war character. It is also generally agreed by economists that the incidence of a Presidential election should not affect this forecast.

This gives assurance of something approximating a normal consuming demand for textiles, but the fact that textile raw materials and manufactures average much higher than any other commodity group has developed price resistance among both manufacturers and distributors. This in the cotton industry represents the salutary operation of economic law that will help to accentuate curtailment of production which is needed to adjust cotton consumption more nearly to the small available supply, and must narrow the present unsatisfactory margin between the price of cotton and prices of yarns and cloths.

THE upward trend of raw wool prices could be checked by a slump in the anticipated volume of consuming demand abroad and in this country and accentuated by an increase. The long-time trend must be upward, however, until world flocks and clips are increased. This plus the outlook for good general business in this country is the basis for forecasting demand for wool manufactures approximating normal and a fair margin between prices of wool and its manufactures.

UNLESS consumption of cotton manufactures is curtailed sufficiently during the next six months to offset a reduction in cotton consumption during the same period of a minimum of 500,000 bales, made necessary by another small crop, a substantial advance in yarn and cloth prices will be inevitable, unless there is a decline in cotton prices 3 to 6 cents below the December average and recent minimums. The latter is the margin below cotton at which manufacturers have been selling goods made from cheap cotton that is now practically exhausted. Such a decline in cotton before new crop prospects can be estimated with reasonable certainty would be too highly speculative to form a subject of forecast.

PRICE resistance in the wool industry is accentuated by restricted consuming demand due to unseasonable weather in some parts of the country, but such reduction of heavy-weight buying and wool consumption as may be thus induced can little more than offset the strong upward movement of wool prices, due to a continued decrease in the world supply of wool.

SILK manufacturers, like cotton and wool manufacturers, would welcome lower raw material prices, but their hope must be deferred until an increase in the new crop may be assured. In the meantime any restriction of demand for silk manufactures due to price resistance is reasonably certain to be made good the following season.

IT is not difficult to predict further expansion this year for most branches of knitted outerwear; problems facing the hosiery and underwear industries, however, make impossible any general statement regarding the likely development of their business. Jobber resistance to higher prices will undoubtedly make profitable merchandising of the mass production of cotton hosiery and underwear difficult.

COTTON INDEX NUMBERS

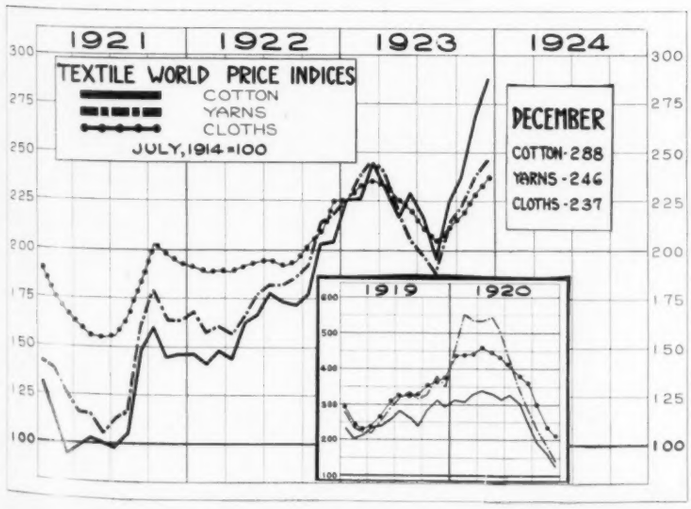
Date	Cotton	Yarns.	Gray Goods.	Colored Goods.	Aver. for Cloths.	Group Average
1914						
March	215	221	214	226	226	221
June	262	294	328	292	308	301
September	236	314	350	315	331	319
December	294	350	432	327	378	362
1920						
March	328	531	475	410	440	459
June	317	510	443	427	435	439
September	253	390	396	413	359	33[illegible]
December	128	142	178	232	206	187
1921						
March	135	125	146	187	168	173
June	100	106	134	171	154	134
September	148	160	172	194	184	1[illegible]
December	146	163	177	208	193	18[illegible]
1922						
March	148	160	166	209	189	178
June	167	177	187	200	194	186
September	171	186	194	195	194	189
December	204	218	222	228	225	219
1923						
January	225	225	226	230	225	225
February	226	237	225	239	232	233
March	244	244	230	241	236	238
April	231	239	224	242	233	2[illegible]
May	217	217	209	240	225	223
June	228	205	202	238	220	2[illegible]
July	217	197	196	256	212	21[illegible]
August	196	188	184	227	205	20[illegible]
September	224	215	207	224	215	2[illegible]
October	237	222	212	225	219	2[illegible]
November	269	237	224	232	228	232
December	288	246	233	241	237	241

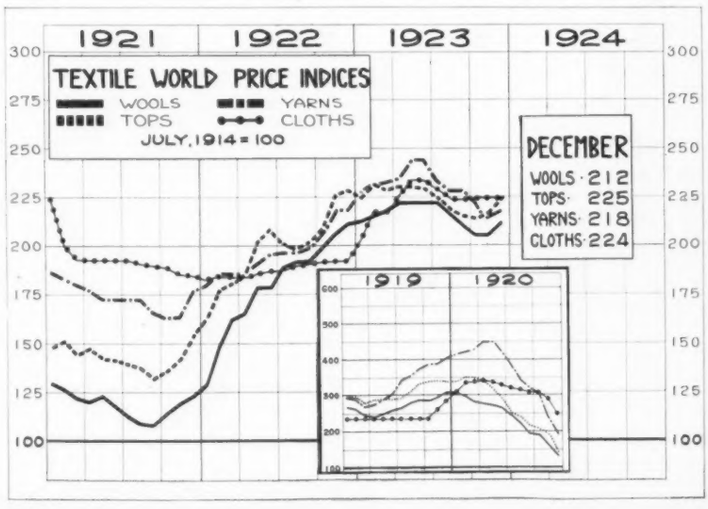
TEXTILE WORLD INDEX NUMBERS

THE index numbers for cotton and wool and their manufactures that have been compiled and chartered by TEXTILE WORLD, and that are a regular part of its statistical service, are calculated as a percentage of prices of staple and typical groups of both classes of commodities for July 31, 1914, as the basis (100). This common basis for raw materials, yarns and fabrics makes possible an accurate comparison of percentage fluctuations. Prices of July 31, 1914, were taken as 100 because of the desirability of making comparison with British index numbers compiled on that basis.

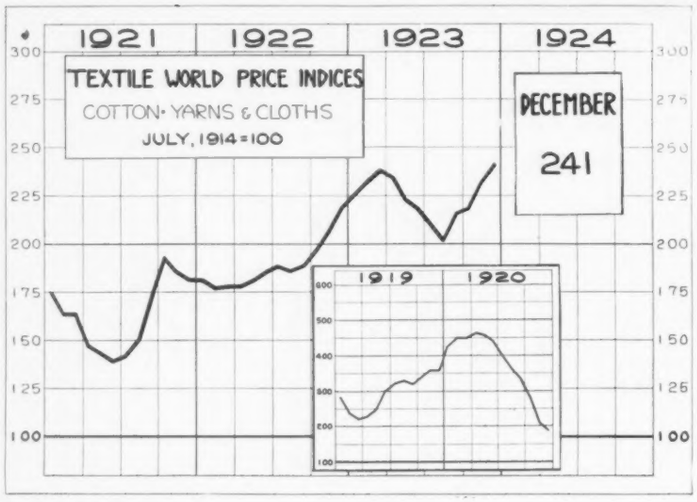
WOOL INDEX NUMBERS

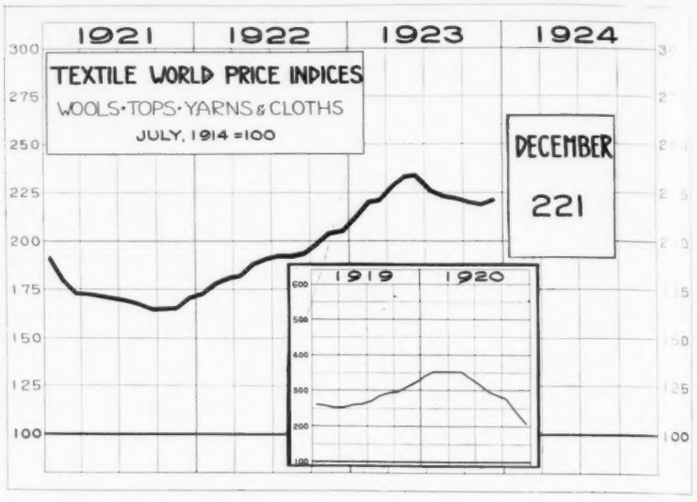
Date	Wool.	Tops.	Yarns.	Cloths.	Group Av'ge.
1914					
July 31	100	100	100	100	100
1919					
March	247	276	270	137	252
June	260	287	296	237	262
September	284	332	378	237	291
December	304	338	404	286	323
1920					
March	282	348	426	331	350
June	260	300	419	325	335
September	199	224	320	311	286
December	132	147	197	253	270
1921					
March	122	145	179	192	173
June	117	141	172	192	171
September	107	132	165	189	165
December	123	164	177	184	171
1922					
March	162	180	185	184	181
June	178	209	195	186	191
September	192	202	199	190	194
December	211	228	218	191	206
1923					
January	212	225	227	203	213
February	215	231	230	216	221
March	217	229	232	216	222
April	222	230	234	225	228
May	222	230	234	233	234
June	222	229	244	233	234
July	222	223	233	228	227
August	216	217	228	223	223
September	210	215	228	223	222
October	205	213	222	234	220
November	205	217	215	224	219
December	212	225	218	224	221

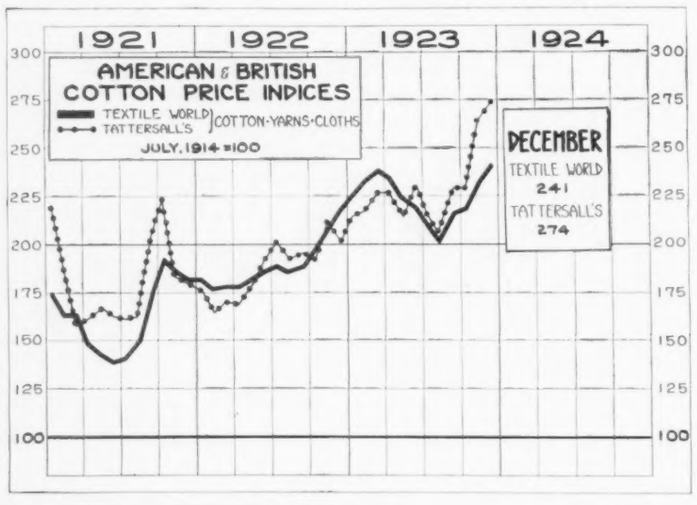


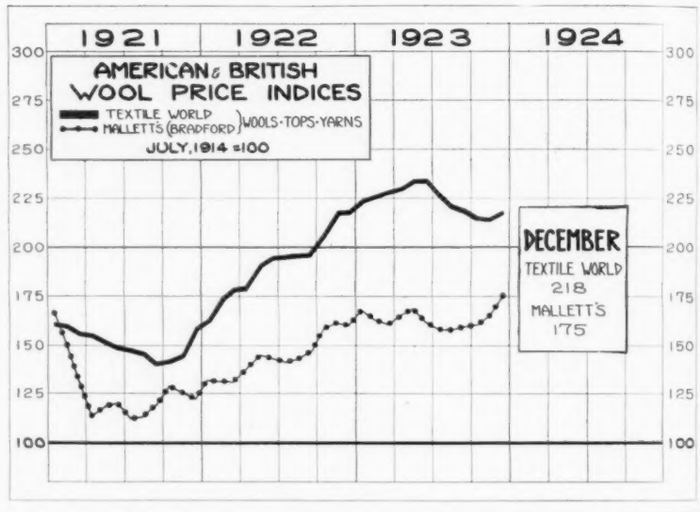


Index Charts—Continued

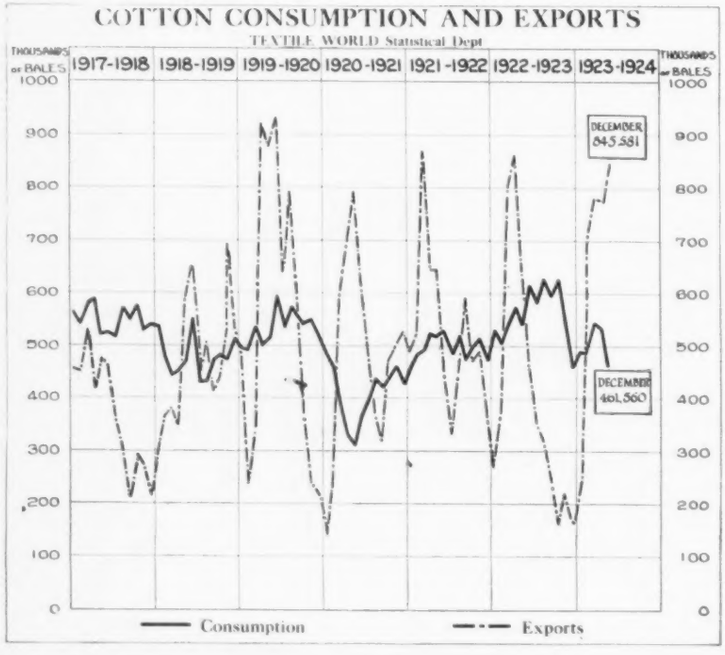


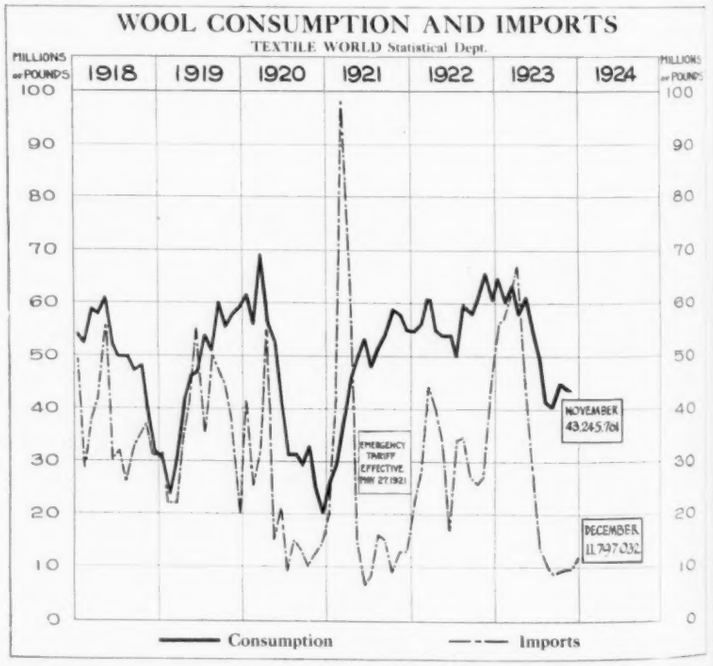


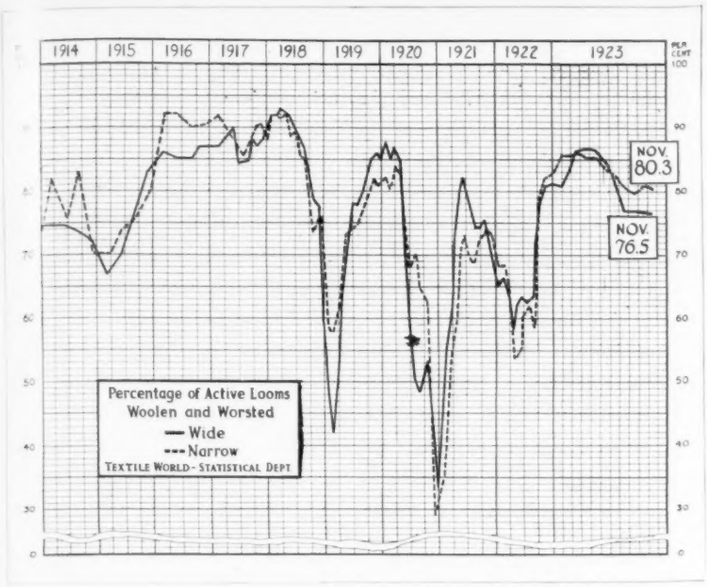


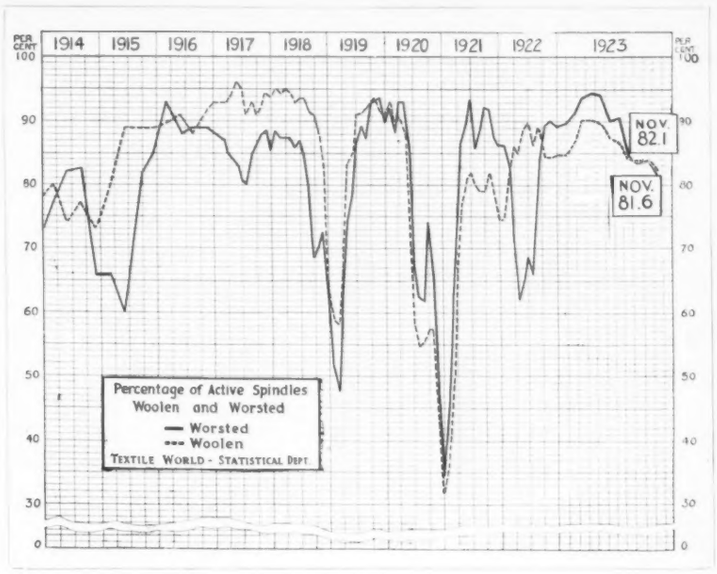


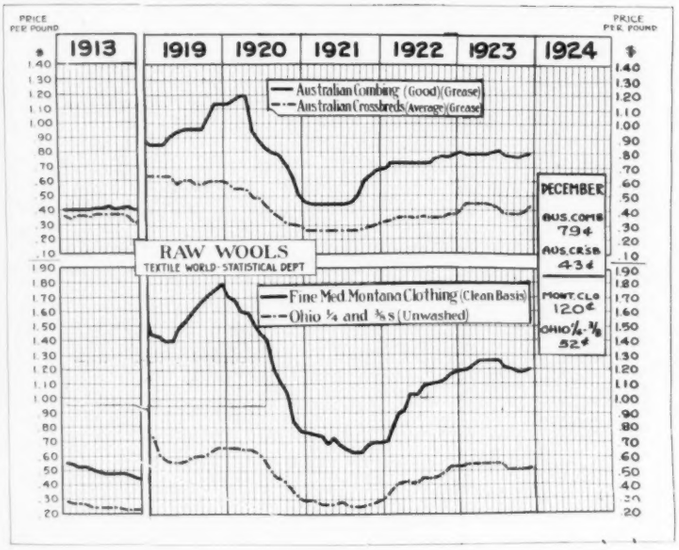
Textile Prices and Activity

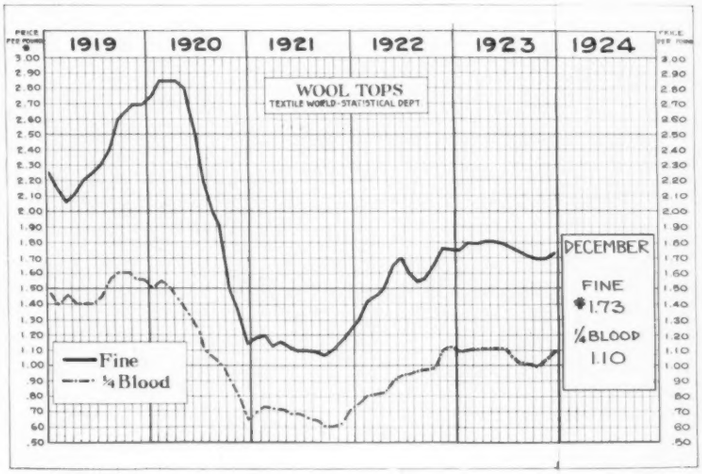


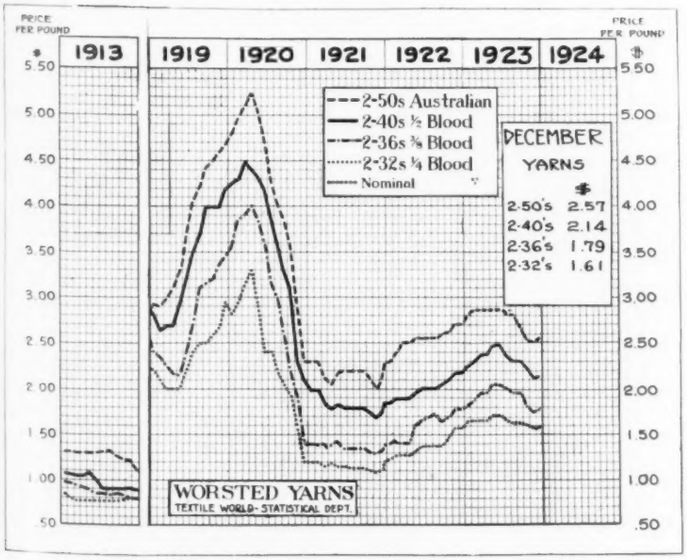


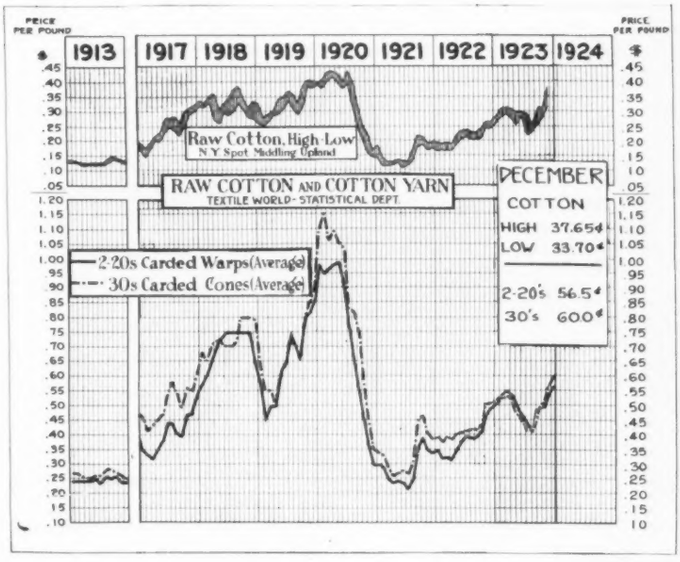

1914 1915 1916 1917 1918 1919 1920 1921 1922 1923
NOV. 80.3
NOV. 76.5
Percentage of Active Looms
Woolen and Worsted
— Wide
--- Narrow
TEXTILE WORLD - STATISTICAL DEPT.


1914 1915 1916 1917 1918 1919 1920 1921 1922 1923
NOV. 82.1
NOV. 81.6
Percentage of Active Spindles
Woolen and Worsted
— Worsted
--- Woolen
TEXTILE WORLD - STATISTICAL DEPT.


1913 1919 1920 1921 1922 1923 1924
Australian Combing (Good) (Grease)
Australian Crossbreds (Average) (Grease)
DECEMBER
AUS. COMB 79¢
AUS. CRSB. 43¢
RAW WOOLS
TEXTILE WORLD-STATISTICAL DEPT
Fine Med. Montana Clothing (Clean Basis)
Ohio ¼ and ⅜s (Unwashed)
MONT. CLO 120¢
OHIO ¼-⅜ 52¢


1919 1920 1921 1922 1923 1924
WOOL TOPS
TEXTILE WORLD-STATISTICAL DEPT.
Fine
¼ Blood
DECEMBER
FINE $1.73
¼ BLOOD 1.10


1913 1919 1920 1921 1922 1923 1924
2-50s Australian
2-40s ½ Blood
2-36s ¾ Blood
2-32s ¼ Blood
Nominal
DECEMBER
YARNS
2-50's 2.57
2-40's 2.14
2-36's 1.79
2-32's 1.61
WORSTED YARNS
TEXTILE WORLD-STATISTICAL DEPT.


1913 1917 1918 1919 1920 1921 1922 1923 1924
Raw Cotton, High-Low
N.Y. Spot Middling Upland
RAW COTTON AND COTTON YARN
TEXTILE WORLD-STATISTICAL DEPT.
2-20s Carded Warps (Average)
30s Carded Cones (Average)
DECEMBER
COTTON
HIGH 37.65¢
LOW 33.70¢
2-20's 56.5¢
30's 60.0¢

Fundamentals of General Business Outlook

By The Brookmire Economic Service, Inc.

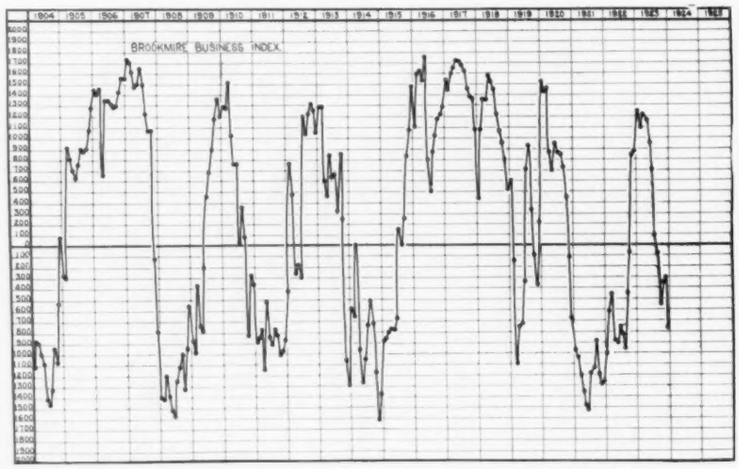
WHAT is the prospect for business in 1924? Seldom has a year opened with such radical diversity of opinion. Authority clashes with authority, and the result is a feeling of uncertainty that is practically universal. The main reason for this confusion of opinion is to be found in the character of the business year which has just ended. It was a year of confused trends and of sharp reversals of direction. Yet it is in the basic trends of activity during 1923 that some clue as to what may reasonably be expected in 1924 is to be found. A turn of the calendar did not change the nature of the fundamental forces which are shaping the major business characteristics of the current year.

A study of the accompanying chart, which is a graphic measure of general business activity over the last twenty years, strikingly portrays the dual nature of 1923. The year opened with rapidly advancing prices, mounting volumes, and very heavy general activity. This lasted until the early spring. At that period a sharp reversal in the direction of movement occurred, and the ensuing reaction has lasted with but a brief upturn in the fall months to the present time.

Last Year's Slump Explained

This is the point at which a vital conflict of opinion arises. Was the downturn which started in the first half of 1923 the beginning of a major downward movement of business which with its ensuing depression will last for a considerable period of time, or was it a reaction in a business movement which is still fundamentally upward, and which may be expected to resume that direction in the immediate future? To supply a rational answer to the question requires a little closer analysis of the 1923 movement.

There is but little doubt that the activity of the latter part of 1922 and the early part of 1923 was abnormal, when surrounding conditions



are taken into account. The two preceding years had been a period of extremely acute depression in which general buying had been decidedly subnormal. The high activity of the latter part of 1922 and the early part of 1923 was based not only upon an improved ability of the consumer to satisfy current needs, but also upon the working off of this accumulated demand. This was particularly true in the building and railroad field, where nearly ten years of subnormal buying had prevailed.

With foreign markets in a relatively chaotic state, domestic consumption could absorb these early volumes only as long as this deferred demand remained unsatisfied. When the impetus from this backlog began to lose its force some readjustment in the domestic rate of production was necessary. It was this readjustment which was seen during the summer and fall months of last year. It represented a scaling down from a demand intensified by the deferred buying of previous years, to a demand for current needs in itself healthy and active but relatively dull in comparison with that of the earlier months of 1923.

This necessary readjustment was intensified by the psychological factors of the situation. We had early in last year the new experience of a government department and of large banking institutions giving official warning throughout the country, that if business did not voluntarily slow down it would soon be forced into a great involuntary liquidation. With the memories of 1920 still fresh in men's minds, the result was an abnormal amount of unwarranted pessimism and uncertainty.

Fundamentals Deserving Emphasis

As a consequence, in our opinion, the present reaction has gone further than was warranted by basic conditions or by the generally prosperous condition of the mass of the consumers of the country. Fundamental considerations to be emphasized at the present time are:

1. General purchasing power is as good at the present time, as it was a year ago, a slight recession in industrial centers being more than compensated for by the improved position of the average farmer.

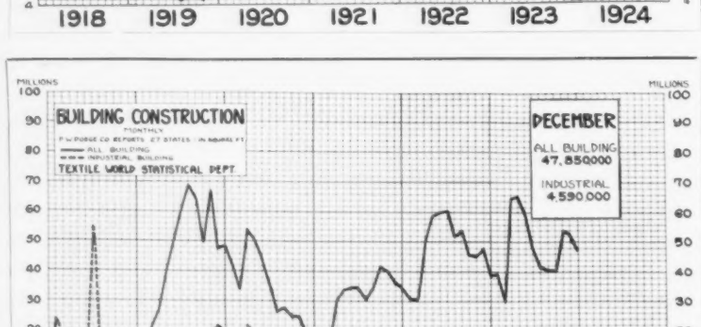
2. Production and consumption are in healthy relation to each other. There are no abnormal inventories generally to threaten markets. The reverse is more probably true, namely, inventories lower than current demand would justify.

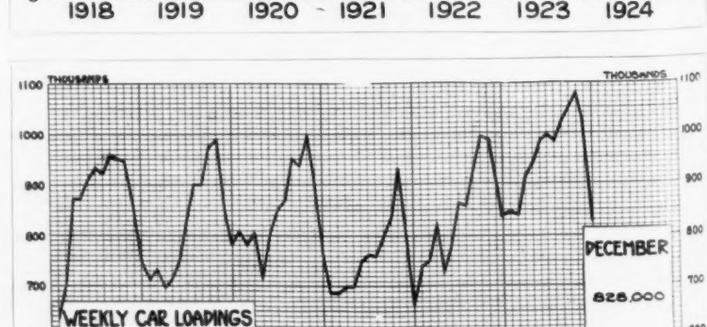
3. Money conditions are easy with no prospect of tightening in view.

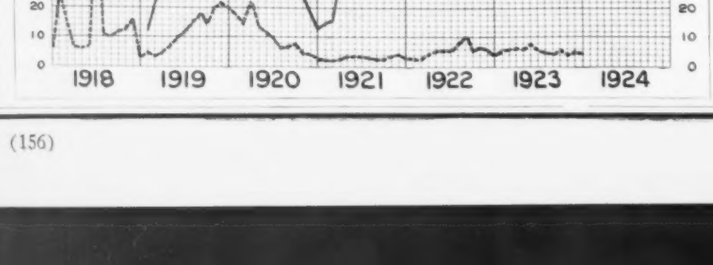
4. Dangerous speculative activities are conspicuous by their absence.

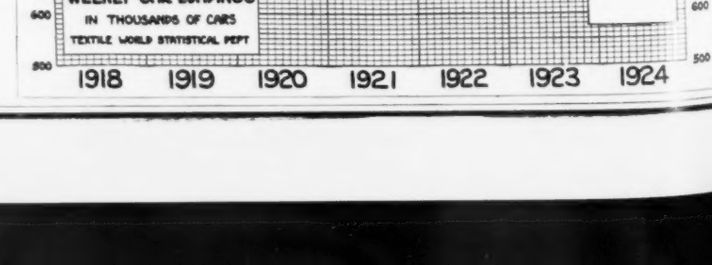
A Sound and Healthy Prosperity

On the basis of the fundamental position of business, it is reasonable to expect moderately rising volumes and relatively stable prices with some upward strength throughout the greater part of 1924 at least. We believe that prophecies of pessimistic flavor are unjustified by the rational prospect of the situation. Such pessimism is of the type which Roosevelt characterized by likening it to a blind man in a dark cellar looking for a black hat which was not there. It simply is not based on the facts.









What Is Wrong With the English Cotton Trade?

The Causes of the Protracted Prostration of the American Branch of the Lancashire Cotton Industry—The Efforts Made to Remedy the Situation and Character of the Opposition—Hope Not Yet Abandoned for Continued Precedence of English Cotton Industry

By *Sir Charles W. Macara, Bart.*

I AM not in the least surprised to hear that America is in a state of perplexity regarding the status of the English cotton trade, for to lookers-on it must pass the bounds of credulity that any community of business men should have behaved as Lancashire spinners and manufacturers have behaved for the past three years. Any industry, we know, is liable to losses at times, but to continue week after week, month after month and year after year, to watch its capital being dissipated, without making a determined effort to stop the leakage must be incomprehensible to anybody who runs his affairs on common-sense lines.

How the Crisis Arose

Let me state, briefly, what has brought us to the pass in which we English spinners find ourselves. We are in the habit of blaming the war for everything, but to understand the present situation right we need to go back to a period anterior to the war; indeed, to so far back, as when the International Cotton Federation was formed, with the object, primarily, of securing for the cotton trade a constant and plentiful supply of the raw material at prices which, when spun and manufactured, would come within the reach of the great multitudes of cotton wearers who are not very far removed from the poverty line. That great international body did much to arouse the trade to a sense of its responsibility in the matter, but owing, no doubt, to the way in which America at that time more or less adequately met the yearly demands of the world's spinners, the matter of providing increasing supplies and reserves of raw cotton did not seem of very great moment, even to British spinners and manufacturers who then grew an infinitesimal quantity within the Empire, and had to rely upon America for a good three-quarters of the cotton they used. Even the dire straits in which they found themselves at the time of the American Civil War had been entirely forgotten, and before long they were lulled again into a sense of security, or were too busy with their own domestic affairs to profit by the warning. "We have always got the cotton we wanted, and we shall always get it," seemed to be their fatalistic way of looking at things; besides, it was, they argued, to America's interest to grow cotton, and to grow as much as possible, and therefore there was no need for worry.

Planters' Stern Decision

But something happened during the Great War which changed the position of things entirely, although even then, the majority of spinners did not grasp its significance. The fateful year of 1914 found us with an unusually large crop of American cotton but with a great number of the world's spindles and looms brought to a standstill, owing to the war, and the situation presented a rare opportunity for creating that reserve of cotton which I had for so long advocated for the purpose not only of safeguarding the trade in the matter of its requirements but of steadying prices at times when outside gamblers were too persistent in their operations. I did all in my power to get this reserve established, but I was defeated by those who took a narrow view, and could see nothing but the immediate advantage of securing cotton at a very low price. The result was immense loss to the planters, who then and there registered a vow that never again would they be caught in the same trap, and that they would, by under cultivation, make spinners pay dearly for the way they had been let down. This was the start of the systematic restriction of crops, and the boll weevil ravages and the labour difficulties created by the war were secondary circumstances which brought about the present alarming situation. Having had exceptional opportunities resulting from the experience I had gained in holding prominent voluntary positions in the cotton industry for many years and so being able to take a comprehensive view of the cotton industry of the whole world, it will be readily understood why I declined to accept the responsibility of continuing in office with what I clearly saw would result in disastrous consequences to an industry international in its scope and which plays so large a part in clothing the people of the world. In addition to this the mishandling of the cotton crop had undoubtedly a great effect in prolonging the war. My resignation, however, of the principal positions I had occupied for so many years did not prevent me from continuing the large educational work that I had carried on as President of the English and International Cotton Federations, and I am pleased that all my efforts in this direction have been placed upon permanent record and are available for everyone engaged in the industry who cares to study them.

Sir Charles W. Macara, Bart., needs no introduction to TEXTILE WORLD readers, nor to the cotton trade of the world, for as the founder and first president of the International Cotton Federation, and more recently as the originator and chairman of the Provisional Emergency Cotton Committee in England, he has proved himself one of the most resourceful and statesmanlike leaders the industry has ever known. His present contribution to TEXTILE WORLD is explained by his following introduction to the article:

"From a letter I have received from the Editor of the TEXTILE WORLD asking me to again contribute to his important and splendidly produced Annual Review Number, I gather that the American people are sadly at a loss to understand why the English cotton trade is in its present state and especially are they bewildered to find that a trade should run so long without insisting upon an adequate return for its labour and for the use of the capital that is invested in it, I feel sure, says the Editor, that there is very general misunderstanding in this country of the exact status of the English cotton industry, of the plans for its betterment that you have been strenuously presenting to the Provisional Emergency Cotton Committee, of the nature of the opposition that the latter has encountered and of the outlook for improved industrial and business conditions either through the adoption of your plans or through the operation of natural economic laws."

The third phase came when the slump began, following the feverish transactions of 1919-1920. The period of short supply and high priced cotton coincided with the fiercest scramble for manufactured goods ever known, and when the boom was over, prices had been forced to a height which many consumers could not follow. Frantic efforts were made to lower costs of production, but though wages were lowered and every item of expenditure in the mills was scrutinised, it was found impossible to get prices of goods down to a workable level. The chief reason for this was that no help whatever could be got from raw cotton; no matter how the costs of production were assailed, the price of the commodity in its raw state went on steadily increasing, until now, thanks chiefly to the activities of gamblers who have fostered, unduly to my mind, the idea of an imminent cotton famine, there is an enforced curtailment of production in most of the mills in the world.

Why England Feels it Most

English spinners of American cotton are naturally hard hit under such circumstances, seeing that they export four-fifths of their production while other countries have little to send abroad as they have not anything like sufficient machinery to supply their home requirements and are, therefore, dependent upon England for a considerable portion of the clothing for their people, and very foolishly, instead of adapting themselves to the lessened demand of their customers overseas, the English spinners instead of recognising the conditions brought about by the war, have entered into a cut-throat and constantly losing competition for the greatly reduced business coming forward. The foreign buyers were quick to perceive the situation, and while protesting constantly that their customers could not pay that which would cover the spinners' cost of production, have been found ready enough to take advantage of forced liquidations and weak selling generally. Over and over again it was proved that the matter did not rest with the "poor consumer," for the protests of the buyers were even more vehement when cotton stood at a shilling a pound than they are today when twenty pence or more a pound is being asked to meet the astonishing rise in the raw material.

It is plain, then, that the fault for not getting sufficient to cover cost of production is due entirely to the weak-kneed policy of the producers, and more especially to the spinners, who have, with their eyes wide open, taken prices which were ridiculously inadequate, and which, it must be admitted, were grossly unfair to those who had invested their money in the industry. Even when excuse is made for the belief that the slump would not last half so long as it has done, and for a natural desire on the part of mill managers to run as much time as possible to reduce costs and keep operatives together, directors of spinning mills are sadly to blame for so long perpetrating the pernicious system of buying more high-priced cotton than they required, with the certain knowledge that the stocks they made would have to be cleared out at pence per pound less than it had cost them to produce the yarn. The amazing thing has been that shareholders have stood such a state of things for so long, seeing that it meant not only the loss of dividends,

but a constant demand in many cases for more money to make up the losses.

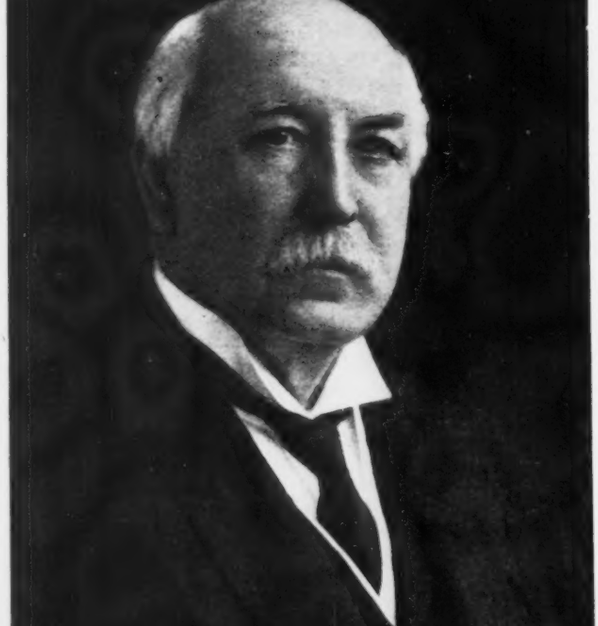
It was not until reserves had been seriously depleted and "calls" on shareholders were getting painfully numerous that the trade began to bestir itself, although warnings innumerable had been issued as to the risks the trade was running. When at last an Emergency Committee, over which I was asked to preside, was formed to deal with the matter, the Master Spinners' Federation, which ought to have foreseen and provided for such a contingency, took an attitude which made it clear that it strongly resented such interference on the part of a section of its members, and talked of "rebels" and "shop stewards' movements" to cover up its own incompetency and to disparage the work of those who were earnestly endeavoring to find a way out of the morass in which the trade found itself. There is no doubt that the tactics of wilful obstruction which the Federation adopted from the start have greatly prolonged the troubles we have had, and been the means of increasing enormously the losses sustained by the large section spinning American cotton in Great Britain.

It is necessary to throw a little light on the composition of the General Committee of the Master Cotton Spinners' Federation if TEXTILE WORLD readers are to understand fully why assistance should have been withheld from a body so worthy and so sincerely desirous of serving the industry as the Provisional Emergency Cotton Committee. The Federation of Master Cotton Spinners in England is composed of two sections, the "American," which spins low and medium counts in the Oldham district and represents about two-thirds of the trade, and the "Egyptian" or fine spinners who are about a third of the whole, and are known as the Bolton section. It is a curious thing that although these two sections have agreed to enter a federation together, they have, as they say in America, never been "good mixers," and Bolton, especially, has persistently stood out for a free hand even when it was vital that there should be unanimity and a strict community of interests. The consequence is that it has been impossible, except on wages or internal management questions, to get everybody to work in unison, particularly, too, as the Federation is not armed with compulsory powers to enforce its decisions.

Easy-Going Oldham

The Bolton section, which refuses to be bound in any way, has all along been mindful to exact the full representation to which it was entitled, while the larger but more easy-going Oldham section has during the past few years allowed its representation on the governing body to fall a long way below what it ought to have been. The result is that now, when we have a crisis affecting the American section principally, we have in the chief offices of the Federation, men who are either bound up mainly with the "Egyptian" trade, or who have no great interest at stake in the mills spinning American cotton. Some there are, too, who have large doubling interests, and it is notorious that while the present trouble has been going on, doubling spindles have been kept busily employed on yarn purchased at pence per pound under cost of production.

It will perhaps be seen, therefore, why it is that while the Provisional Emergency Cotton Committee has been battling for the establishment of a body which should have the power of controlling all sections, the Federation of Master Cotton Spinners has been so inactive and so unsympathetic towards those who have been working for reconstruction in the industry, and it will explain to a great extent why so much time has been occupied in achieving so little. Even when it is computed that we are losing money at the rate of £1,000,000 a week, we have still the same old circumlocutory methods in the Federation to deal with, and every obstacle is put in the way of progress.



Sir Charles W. Macara, Bart.

Why the Ballots Failed

The American reader will no doubt wonder why if the Federation policy has been so obviously ineffective, the ballots conducted should so often have resulted in findings being given against the Provisional Emergency Committee. The answer is, first of all, that the Egyptian third have all along been solidly against the Emergency Committee's proposals, being strongly opposed to anything in the way of a levy on spindles to help those suffering through the falling off in the export trade. To this should be added the large amount of prejudice created against all forms of "control," especially since the Government bungled so badly in numerous instances during the war; and, furthermore, no little harm has been done to the progressive movement by the constant re-iteration of the statement that the spinners composing the Provisional Emergency Committee were simply a disillusioned set of men who had been victimized in the re-capitalisation transactions at the height of the boom three or four years ago, and were now anxious for help to get them out of their difficulties. Two out of the three of these contentions are myths, and the third is based on shortsightedness and selfishness, but there is no doubt that in combination they achieved, temporarily at all events, the objects of those who disseminated them.

Dealing with the bogies of control and re-capitalisation, one need say only that the Cotton Control Board established during the war, and which was intended to be the model for the body the Emergency Committee wished to set up, was one of the few real successes of the war period, and it was a success because the Government very wisely allowed the cotton trade to do its own controlling, and simply backed up the decisions arrived at by the trade itself. That Control Board was of inestimable benefit to the cotton industry, and those employers and operatives' leaders who were in closest touch with it have constantly bewailed the fact that it was disbanded, and are confident to-day that had it been retained down to the present time, we should never have had to deplore the disasters and losses of the last three years. The disbanding of that Board was most untimely, seeing that the troubles we have to-day are a direct outcome of the war.

Re-Capitalisation Justified

I have dealt at much length in previous articles with the fallacies respecting the re-capitalsation of Lancashire cotton spinning mills, and have shown by means of figures that cannot be controverted that there can be no over-capitalisation when at to-day's prices it would be impossible to replace the buildings and machinery at anything like the cost at which the majority of the mills have been turned over; and, moreover, that the very fact that directors of non-recapitalised mills have to insure at the values placed upon re-capitalised mills is proof that recapitalisation was not overdone in the large proportion of cases. If there was anything in the statements of those who are continually endeavoring to cast odium on re-capitalised mills, we might expect to find all the losses at the present time on the side of the re-capitalised concerns, but as a matter of fact the returns for the past year show that one class of mill has fared as badly as the other, especially if we take into consideration the meagre way in which the non-turnover mills are allowed by the Inland Revenue to depreciate their property at the present time.

The Fine Spinners' Opposition

As regards the refusal of the spinners of Egyptian cotton to fall into line with the American section on the question of the levy, I consider that the Bolton attitude is both foolish and shortsighted, for the simple reason that it would have been well worth their while to pay such a levy to ensure that their trade was not interfered with. As it is, a large number of spinners in the Oldham district are turning to the spinning of Egyptian cotton, and in this way the one good section we have at present may be placed before long on the same plane as the other.

One cannot help mentioning, also, as an example of the illogical attitude of those who oppose co-operation in the trade, that the controlling heads of the Fine Spinners & Doublers' Association have been among those who have offered the strongest resistance to the Emergency Committee's scheme of control, and yet the Fine Spinners' Association is a combination with precisely the same objects as are now sought to be obtained for the whole of the trade, namely, the protection of the trade's interests and the maintenance of prices at a profitable level.

Help From Operatives

It should be recorded, too, that the Masters' Federation have made great play of what they regard as the legal

difficulty of establishing control of the industry, arguing that a Control Board would have no power to enforce its edicts on those who were not willing to be controlled. There would be some point in this if the scheme the Emergency Committee suggests left out the operatives, but with the operatives working hand in hand with the employers all things are possible. Besides, if we can get Government aid in making all mills pay a sixpence per bale levy on all cotton consumed, in order to promote cotton growing within the Empire, we could, no doubt, get the State to back any other scheme which had the approval of the majority of those in the industry, representing both capital and labor, for it is unlikely that any Government would care to run counter to the practically unanimous wish of a trade so large and important as is the English cotton trade.

This bringing in of the operatives would have a salutary effect in another direction, for it would be a safeguard against anything in the nature of a trust developing out of the control scheme. It would obviously not be to the interest of the workpeople that prices should be run up to a level which would have the effect of lessening demand and curtailing employment, and if such a thing were attempted, it would be checked immediately by the operatives' representatives on the board.

But in spite of all and every opposition, there is no doubt that the Emergency Committee's scheme is making headway, and this is shown not only in the changed attitude of large numbers of influential people who opposed it when first suggested, but in the fact that the Lord Mayor of Manchester succeeded in bringing together representatives of spinners, manufacturers and operatives and getting established a Joint Committee which is endeavoring to put some such scheme as that suggested into operation. Their progress is exasperatingly slow in view of the large interests at stake, but I am hopeful that something will yet be done to save the trade before matters have been allowed to drift too far. Seeing that the Egyptian section has already definitely withdrawn from all "control" negotiations, the Joint Committee cannot hope to carry the whole Federation with it, but I am confident that sooner or later all will be impressed with the advantages of working together. Organization has brought success to the cotton brokers, the bleachers, the dyers, the calico printers and others who handle cotton goods in their various stages, and it will be odd indeed if the spinners and manufacturers, with the help of the operatives, cannot make a success of their respective branches. I took a leading part in organising the Scottish and Irish bleaching trade many years ago, and the members of that trade have never ceased since then to secure a proper return for the capital invested, even when the volume of goods to bleach has been very much reduced. It will be the same with the British cotton spinners and manufacturers, and what is more, the new development will, to a large extent, be the means of eliminating the baneful influences of boom and slump which now play such havoc with the cotton trade.

Wages and Hours

The establishment of such a body as the Provisional Emergency Cotton Committee has in view will have far-reaching effects on the trade, as the fixing of minimum prices for yarn and cloth will be but one of its important duties. One of the prime necessities of the present position is, of course, the arrangement for a more ample supply of the raw material, and this, next to stopping the losses which are bringing the trade to the verge of ruin will call for immediate consideration.

I noticed in a leading article in a recent number of the TEXTILE WORLD that the writer holds the view that what is wanted before everything else in the British cotton industry is a drastic cut in wages and an increase in the working hours of the operatives. "If cheaper cotton is not to be expected this season, and profits and all other costs have been cut to the bone," says the writer, "then labor costs must be reduced and overhead charges per pound and yard must be lowered by working longer hours." With this conclusion I am not in agreement, and for the sufficient reason that the difference between paying a good wage and a starvation wage to the operative has been proved to be almost negligible in the ultimate cost of cotton cloth to the consumer. Moreover, the extension of hours as a matter of a fixed policy is now out of the question. In emergencies it may be advisable to lengthen the working day, but the industrial world is moving decisively and irresistibly towards shorter and not longer hours, and even Oriental countries are following the Western world in this matter. Science and invention will in the future, no doubt, make the working day shorter than it is at present; but, at all events, the tendency of the age is all against the long hours we had in the mills formerly. What we want today is concentration and efficiency in labor matters, not hours of undue length, and with a full development of the world's resources there need be no going back to the slavery of the old days before the Factory Acts. The pressing need in the textile world is for cheaper and more plentiful supplies of the raw commodities, and it is in this direction that we shall have to look for a solution of the problems that we have to deal with nowadays. It is because of this lack that we cannot find employment to fill the 48-hour week we have at present. The writer is correct in his conclusion that "the impoverished peoples of the world who are the principal consumers of British textiles simply lack the purchasing power to keep Lancashire spindles and looms fully employed at the present minimum prices of cotton, yarns and cloth," but we can look for no great stimulation of consumption with raw cotton at the price it is, no matter how we cut down costs of production by lowering wages and increasing hours of labour. The demand is there when we can get down to a reasonable level, but no level can be secured which will be reasonable to the great proportion of Britain's customers while the raw material is short in supply and costs as much as 20d. a pound.

Trusts to be Avoided

Our only hope at present is in the expansion of our own and other cotton fields, now that America has adopted deliberately a policy of restricting supplies, and while we are marking time we must devise a scheme whereby we can at least get our costs of production for the limited demand for goods that is available. At present we are going fast on the road to ruin, and if the trade is not pulled up it will be irretrievably lost. Even those who are now fattening at the expense of the spinner and manufacturer must see that the policy they are pursuing must be disastrous in the long run. No business can be run at a loss indefinitely, and the ruin to the producer in this case must spell ruin to foreign merchants, shippers, and all who are now deriving advantage from the present state of things. It has to be remembered that if the present concerns are ruined and are acquired by the financial trusts that are now lying in wait for the unfortunate, those who are squeezing the spinner and cloth maker at the present time will get little satisfaction ultimately. We know how trusts work, and no people on earth know it better than Americans. Mr. Frank B. Kellogg, the new American Ambassador to London, has had a fair experience of them, and he tells us that "corporations do not reduce prices except for the purpose of freezing some individual out. When they get control, up go the prices to a higher level in order that lost profits may be recovered." He tells us also that there are no good trusts, and that once at their tender mercies, the consumer does not get the benefit of any cheaper cost of production.

American Free Trade Example

As regards the status of the British cotton industry, I may say, in conclusion, that it will be quite as high as ever, once we can get the trade working on co-operative lines. Its prestige as a producer of cotton goods is as great as it ever was, and no other competitor has arisen who can supply the world's demands. Indeed, it may be said that Lancashire has no competition worth mentioning for the classes of goods it produces. Even America, I notice, has still little to export despite her increased production of cotton goods, and no other foreign country today is in the same favoured position as she is.

This all shows that England has nothing to fear once she puts her own domestic matters to rights. Her recent decision on tariff matters leaves her in a thoroughly sound position to continue her international trade, although I must say that instead of coquetting with questions of Imperial Preference, I should have greatly preferred that this country should have followed the example of America in one important particular, and have plumped for an out-and-out scheme of Free Trade within the Empire. Many people are apt to forget that while America adheres stoutly to her policy of tariffs against foreign countries, she has the enormous advantage of Free Trade within the borders of her 48 States, which comprise no less than three million square miles of territory and have a combined population of something like 110,000,000.

With such an area and such a vast number of people to cater for at home, America stands in a totally different position from England, which can boast no fiscal advantages in her own colonies and dominions, and has at present practically the same difficulties of trade to meet among her own peoples as among what we are in the habit of describing as the foreign nations of the world. Had we the same facilities throughout the Empire that America has from Atlantic to Pacific, the attempts to hamper our trade by all kinds of fiscal restrictions would have little or no effect upon us. As it is, we are in no way daunted with the prospect for the future of the cotton industry, granted that we get proper organization at home and a sufficiency of the raw material to meet our needs, and that the policy of drift which has prevailed during the last three years is abandoned.

Disturbance Less Than Usual

By *Robert Chapman*

IN my opinion, disturbance to business generally and the textile trade in particular, during this Presidential election year, will be very much less than usual. I look for very little disturbance to business from this influence.

Today, and probably in future months, the textile trade will feel the effects of rampant speculation and gambling in our great raw material—cotton. Such wide variation in values of the raw material causes uncertainty and timidity in the minds of buyers. They fear to operate freely. Under such conditions, every buyer of goods feels the stern necessity of great caution, and the spinner likewise. For this reason, I look for dragging, subnormal coonditions in textiles, but not caused by Presidential election.

* President Southern Consolidated Yarn Spinners' Association, Cheraw, S. C.

Trade Association Activities and Attorney General

Statement of the Latter Confusing and Not Believed by Lawyers to be the Law—Business Men Afraid to Combat Decision—Present Situation Likely to Lead to Confusion and Speculation—Pronouncement of Attorney General Regarded as Unfair

By a Special Correspondent.

BUSINESS men have believed with Secretary Hoover that "* * * * the collection and distribution of current unidentified information and statistics as to production, stocks on hand, and prices on closed transactions should be permissible providing it is all made available on fair terms, not only to the association members, but to all others interested, including the general public.

"Such knowledge is essential to the consumer, producer, manufacturer and distributor, as it places them all in a position to interpret and judge market conditions intelligently on the basis of supply, demand and current prices, and to gauge their purchases and sales accordingly. This unquestionably should be of tremendous aid in the economical conduct of business and redound to the public good.

"If business be compelled to operate without such vital information it will naturally be forced into unscientific and highly speculative avenues.

"Competition based on fair and equal inforation of existing conditions would more likely result in lower prices to the consumer than competition based on uncertainty, in which each dealer must add something to his price to cover unforeseen eventualities."

The above is the opening appeal in Secretary Hoover's last letter to the Attorney General. It is not intended to be a statement of the law, but is without doubt a correct analysis of some of the principles of trade economics involved in this controversy.

Attorney General Confusing

The reply of the Attorney General is confusing on some points. It maintains the correctness of the view expressed in 1922. Then it states the two outstanding points that were then believed by the Department of Justice to justify approval of Mr. Hoover's program, thus:

"Two objects were had in mind during the conference which preceded the above mentioned correspondence, both of which it was thought were secured by the limitations embraced in the above quoted paragraphs of your letter: First, that the information distributed should be general, and, second, that individual contact between those engaged in the same industry with reference to matters which vitally affect prices should be avoided."

And the next sentence seems to furnish some ground for permission to many associations which have so revised their plans of exchanging data as to preclude the possibility of each member revealing to each other member his individual business or to communicate on subjects vitally and necessarily affecting the price. He says:

"If the character of the information and the manner of its dissemination be restricted as specified in your letter, one member would not be informed as to the individual activities of another member, and those engaged in the industry, would be prevented from revealing their business to their competitors."

But if, as finally intimated by the Attorney General, the law as construed by the courts prohibits any other use whatever of this data than to furnish it to a governmental agency, then the use of trade associations, national as well as local, is to be very materially restricted if not indeed totally destroyed.

Bearing of Recent Cases

To the extent that this last opinion is founded upon the consent decree in the Tile Association case, this decree is not such a precedent as would carry weight as an authority cited on a question of law in a contested case in any other court. Its value is that it is to a large extent an indication of the attitude of the Department of Justice towards the extensive private exchange of intimate trade data between competing manufacturers.

The opinion and decree in the cement case are of more substantial consequence. That rests upon a contested case and is an adjudication upon controverted facts and unless and until changed by a higher court on appeal is a precedent that will be recognized by other courts in cases involving approximately similar facts. In the cement case the court found a basic price list uniform throughout the trade; uniform trade discounts; uniform cash discounts and terms; uniform quality in products; uniform freight terms; uniform basic shipping points similar to the Pittsburgh case rule in the steel trade; uniform selling contracts with uniform restrictions which confined each purchase to the exact purpose, job and destination to which it was shipped and precluded putting any surplus from these sales on the general market, a system of checking up and an undue measure of espionage by traveling agents of the Association. All these things were found to be a material interference and restriction on normal competition, as they may well have been, if true.

The writer knows of no trade association practicing or permitting such methods. But under all these conditions the most conservative operations must be carefully conducted.

There is again a very insistent movement on foot by which general business hopes to secure some relief through legislation, by which plans may be passed upon prior to adoption.

The creed announced by the Attorney General's office in response to Secretary Hoover's appeal seems to me to be a direct attack upon the freedom of the press for one thing. It would be impossible for newspapers to collect all the data needed for publication, from individuals. The consolidated picture, the average of productions and prices are needed for reports to the public. If the Attorney General is right it might be a conspiracy for papers to induce the collection of this data by any organization for any other purpose than to furnish it directly and only to governmental institutions. I do not believe that this is the law, but manufacturers and merchants do not want to engage in any undertaking that seems inevitably to lead to prosecution. They may believe that this is persecution but they do not want to take a chance on being annoyed or indicted in the federal courts. If they should take this chance and be acquitted, the expense in time and money is considerable and a great many of them are of the opinion that it does not pay, even though the trade information sought, secured and distributed by means of many of these trade organizations, seems to be one of the essential features to good merchandising.

It has been suggested in some quarters that this matter should be taken up and placed in its entirety before some higher authority in the Administration and some means adopted whereby some reasonable application of these laws can be made to business enterprises. Business is exasperated if not hopeless.

Against Economical Merchandising

Another thought that is often expressed by business men, more in wonderment and consternation than in condemnation, is that these laws enacted for the control of monopolies and combinations adverse to the public interest, are so often used against programs that upon careful analysis are shown to be directly in favor of intelligent economical merchandising. They have seen for the first time in the history of the administration of federal laws an honest, persistent effort on the part of the head of a federal department to build a system of cooperation that meant something to every element in every trade and they resent an attempt at its destruction. It is an open secret that departmental jealousies, the mental twists of small politicians or division assistants, with no knowledge and no thought of the larger principles of trade economics, have gone far toward junking the first constructive plans for business promulgated by an understanding head of a great federal institution. The obvious appeal from the Secretary of Commerce in the correspondence last made public was entitled to a better analysis of a very pressing condition in business, a necessity in every trade, than this unjustified misapplication to general business of a specific rule in a consent decree that is not a precedent in any future contested case.

The ruling is stamped with the approval of the head of the legal department of the Government. By lawyers it is not believed to be the law and by business men it is not believed to be sound sense or fair. But the great authority of the Department of Justice is awe inspiring. It is frightening. It will probably impress most business men as the final word. In the end it means confusion, disorder, speculation and a vast expense to the public. It is possible that wiser counsels will prevail but there is nothing of that kind now on the horizon of business cooperation.

Last Year's Conditions Continue

By *Frederick K. Rupprecht* *

WITH fundamental conditions good, as I believe them to be, I look forward with entire confidence to the opening year, although I do not shut my eyes to the difficulties to be encountered. These difficulties—notably conditions affecting the raw material situation—are too well known to require review. But among them I do not count the fact that this is the year of a presidential election. I do not believe that this fact will have an appreciable effect, favorable or unfavorable, upon our business.

On the other hand the prospect of tax revisions along the lines recommended by Secretary Mellon will give an uplift to industry, the importance of which cannot be overestimated.

Another factor more important in my jugment than the presidential election is the improving outlook in European affairs.

I can recall some elections, especially those in which a change in tariff policy was involved, that did result in industrial hesitation. Neither the tariff nor any other radical change in policy is involved in this year's election. Last year with all of its difficulties showed the possibilities of American production and consumption. These factors continue.

* President, Converse & Company; Chairman, Executive Committee, Consolidated Textile Corporation.

Practical Application of Research Work

Cotton Research Company Does Work Systematically and Scientifically That Was Formerly Done by Mill Men Intermittently and by Rule-of-Thumb Methods—Analyzes Mill Problems Both in Mill and Laboratory With Cooperation of Practical Mill Men

By *E. D. Walen**

DURING the past several years a great deal has been said and written in a general way about research as applied to cotton manufacturing and it is possible that it has been confusing to those who have attempted to cull from it some proof of the advantages and need of the so-called research work. Possibly those who are still seeking such proof may be surprised by the assertion that all people engaged in manufacturing do a great deal of research work, but it is, nevertheless, true that practically every mill man does some research work during the course of his duties; for research work is merely the careful studying of manufacturing conditions, the accurate observation of their performance, the careful comparison of performance with other researches or standards, and the drawing of conclusions from the results obtained.

The sort of research or investigational work done by the manufacturer of any industry is likely to be spasmodic, and often no attempt is made to measure the magnitude of the difference observed. From this it may be inferred that research work as it has been discussed really refers to a concentrated effort to dig into manufacturing problems by the employment of more scientific method of observation than the hand and eye affords.

The Cotton Research Company has been in operation for some four years and it has attempted to concentrate its efforts upon the problems which arise in the mills and the problems which all manufacturers know are constantly with them. Many of these problems are not very important in the ordinary course of events, but since the element of competition has increased in importance it has been desirable to investigate all things carefully. It may be stated without fear of dispute that the Cotton Research Company would probably have been a failure if it had been operated as an independent organization, but with the mills cooperating in the planning of the work and in applying the results obtained, a success has been made of this undertaking. The work of the Cotton Research Company has been exactly what the average manufacturer would do if given the requisite time and equipment in an effort to secure quality, high production and lower cost.

A Study of Variables

The entire manufacturing problem in the textile industry may be considered very largely a study of variations, and in order intelligently to consider any phase of manufacture it is necessary to devise accurate means of measuring the properties of materials and products and to know how best these results should be worked up to present a clear index of performance. The laboratories of the Cotton Research Company have been designed along these lines and necessary equipment for the measurement of uniformity of staple, breakage, strength, elasticity and the like have been provided and applied not only to the investigations of manufacturing in the laboratory, but have been applied to the determination of the exact performance of the several mills.

The Mill Survey

The manner of presenting the results of investigation and test has been accomplished through the medium of a mill survey. The mill survey is a very careful listing of each and every factor which governs production and quality in the mill and the comparison of these with standards which have been set up from the results of analysis and investigation. In this way it has been possible to apply the information concretely to specific mill problems existing in a particular plant having its own peculiar practical working conditions.

A mill may be considered a very nearly balanced combination of raw material, machinery, adjustment of machinery, speeds, drafts, help, supervision and methods of supervision. It very seldom happens that a change in any one of these may be made without its reflection on one of the others. The exact measurement of performance after a particular function has been changed leads quite readily to the cause and effect upon the balance of the other features and through such a procedure it has been possible to come closer to laboratory results than it would at first be expected.

Such things as the running of a certain kind of cotton may depend upon some adjustment of drafts, speed, or even upon a different method of fixing or cleaning and it has been the failure to recognize this idea which has led many people to conclude that laboratory conditions are not mill conditions and that things will work in one mill and will not work in another. It is perfectly true that they will not work, but it has been the desire of the research frame of mind to consider the reasons why things do not work and to consider ways and means of adjusting circumstances as well as adjusting conditions to suit circumstances.

As an example of the application of analysis to manufacture, let us consider the probable steps in investigating yarn being made by a particular mill.

It is observed at the outset that it would be impossible to judge with any degree of certainty the relative evenness of the yarn in question except within fairly wide ranges. The chart, Fig. 1, shows a permanent record of variation in yarn diameter of two yarns which were made a little differently. This record provides a permanent measurable means of defining the regularity of the two yarns and these records may be transported from place to place and carried on from year to year without fear of their being influenced by the judgment of different people. They further indicate different classes of unevenness and a series of such records will naturally class themselves more or less into definite divisions, depending upon the particular kind of fault which causes the irregularities.

Having once determined the evenness of yarn in numerical numbers it is possible to make certain adjustments and changes in the manufacturing, and perhaps the cotton, to make other yarns which may be definitely measured and accurately compared.

The causes for differences in unevenness may be due to such things as irregularity of roving, staple breakage, machinery speeds, and the like. It is interesting and nearly always very valuable to be able to measure and eliminate as many

*Manager, Cotton Research Co., Boston, Mass.

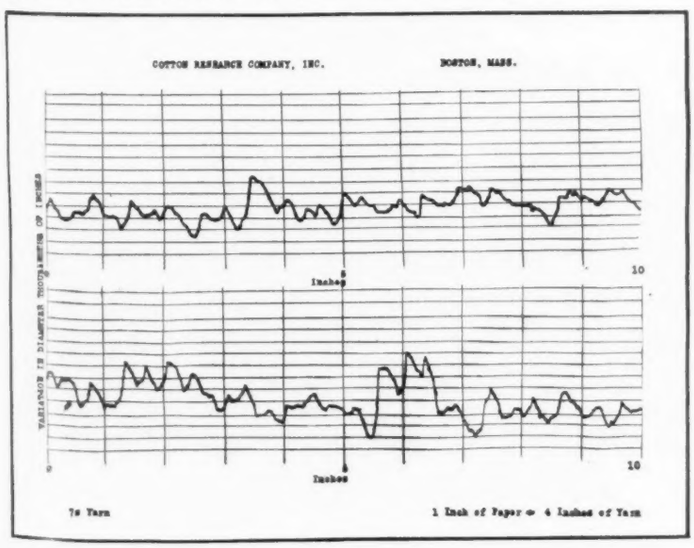


Fig. 1.

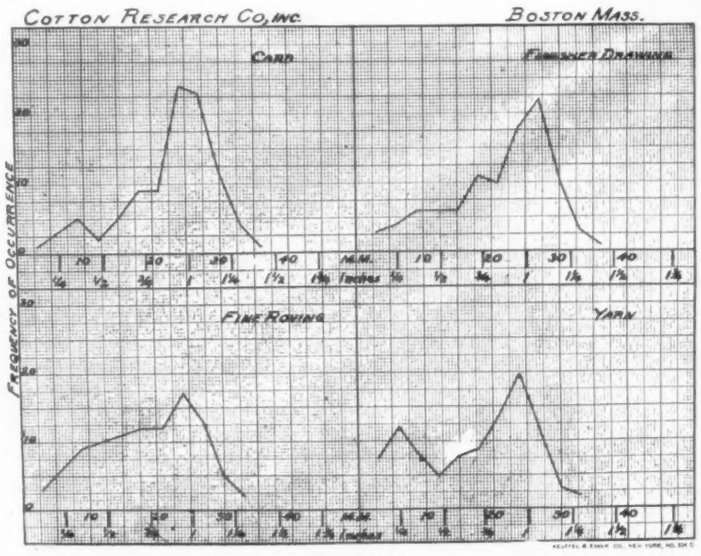


Fig. 2.

things from the consideration as is possible. For instance, the staple breakage might be quite readily measured and charted as in Fig. 2.

This diagram shows the distribution of length in cotton from the card to the yarn, and it demonstrates quite clearly that a material staple breakage was taking place in the fine roving frames with the result that the distribution of lengths in the yarn is not very much different from a yarn having a percentage of waste in it. It is entirely possible that the staple breakage measurement may not show any positive results except that it definitely dismisses the particular question from the consideration of yarn evenness. On the other hand, if a positive showing is made the difficulty may be corrected and the results measured. Even then the fault may not have been entirely corrected.

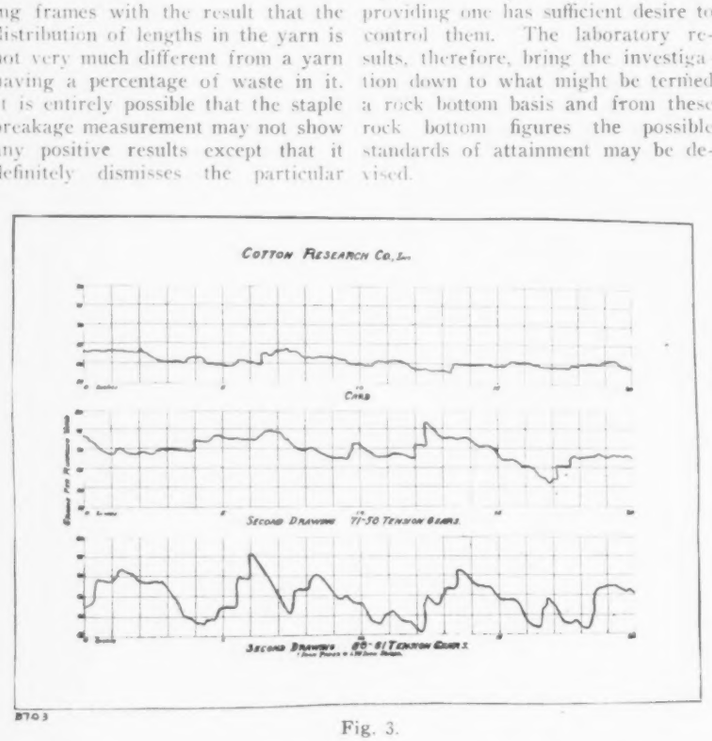


Fig. 3.

Why Measurements Are Necessary

Another thought which comes to mind in the consideration of uneven yarn is the regularity of slivers and roving. The chart, Figure 3, shows a typical set of measurements on the evenness of card and drawing sliver. The bottom curve on the chart shows the effect of improper tensions in the drawing frame. It is very difficult to judge the effect of drawing tensions on the regularity of the sliver for the sliver looks very little different with the different tensions, and measurements are therefore necessary if one wishes to know the effect of drawing frames upon the ultimate yarn. This same kind of measurement may be performed on the other roving operations and shows definitely whether or not the non-uniform roving is the cause for uneven yarn and it also shows the point at which the uneven roving may have been made.

There are a great many other kinds of measurement which can be made and which the Cotton Research Company makes on material produced in its own laboratories as well as in the mill. The advantage of making measurements on samples produced in the laboratory is that the factors are pretty well under control and generally they are not subject to mill conditions. The term "mill conditions" is used to refer to the effect of the average operator on the running of the work, and this in its final consideration might well be considered as faulty operation and factors which are subject to more control providing one has sufficient desire to control them. The laboratory results, therefore, bring the investigation down to what might be termed a rock bottom basis and from these rock bottom figures the possible standards of attainment may be devised.

Importance of Laboratory Work

The laboratory, for instance, may make exhaustive experiments on a sizing compound, measuring very accurately the increase of strength, flexibility, elasticity and penetration of certain compounds and may find a condition in practice which is illustrated in Figure 4. This figure shows a distribution of warp-end breakage in a particular plant operating a rather easy weave. It takes but a glance to see that the slashing compound has but very little influence upon the running of this work, and during the ordinary course of events if the laboratory compound were used in the slashing the answer would come back from the mill that it was not any better than what was being used. At the same time this condition of loom breakage would be considered by a great many people as being "practical working conditions," and they are. However, the use of systematic analysis and study, which reduces many factors to a definite basis, shows very forcefully the actual conditions existing and in the majority of cases the immediate reaction is a consideration of how the practical conditions may be made a little different. In this particular case, with weaving-end breakage made upon a study of slashing, it might well call forth a study of spooling, spinning and cleaning. In the study of spooling on a systematic basis I am sure that other things would suggest themselves.

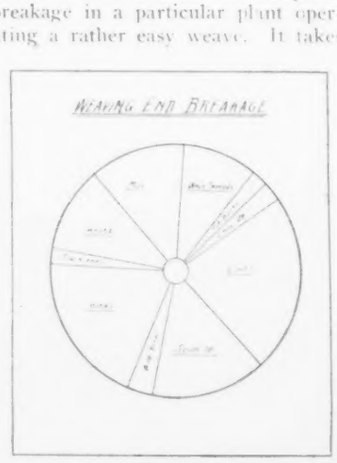


Fig. 4.

The sort of analysis illustrated by Figure 4 is not particularly complicated and it is just this sort of thing which the Cotton Research Company has been applying to the mill problems which in their elements group themselves around the combination of raw materials, machinery and men, and it has been our experience that if one really knows accurately the conditions it is relatively simple to show benefit from this class of work.

Cotton Mill At Alabama Prison

Complete Cloth Manufacturing, Dyeing and Finishing Plant Established at Kilby

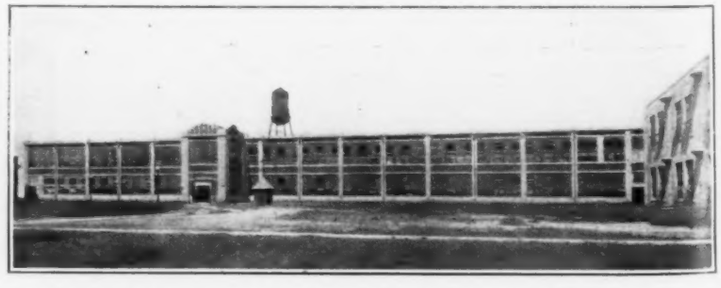
THE profitable employment of prisoners is an age-old problem which the State of Alabama has attempted to solve by the erection of a modern and complete cotton mill in conjunction with a shirt factory in the State Prison at Kilby, Ala., near Montgomery, the state capital. The use of convict labor in textile manufacturing is not new. The United States Penitentiary at Atlanta, Ga., operates a duck weaving plant containing 400 looms which produce duck in various weights for government purposes. Until a few years ago a hosiery mill, making low grade cotton hosiery, was in operation at the South Carolina State Penitentiary at Columbia, S. C. This hosiery mill was abolished by act of the Legislature. Therefore, while novel, the Kilby Cotton Mill and Shirt Factory in the Alabama State Prison are by no means unique.

Spin, Weave, Dye and Finish

With the exception of posts of observation for the guards in various parts of the mill, the Kilby Cotton Mill is similar to any other modern cotton mill, despite being enclosed by the walls of the Alabama State Prison. Reinforced concrete construction was used in building the mill and shirt factory. Side walls consist of concrete skeleton fitted with steel sash. Brick panels on the concrete surface of side walls relieve the monotony of the concrete and make the appearance of the mill much more attractive. Floors and ceilings are supported by mushroom columns. The main mill building is two stories high, 107 ft. wide by 367 ft. long. The Shirt Factory is of the same width as the cotton mill but only 169 ft. long. The Shirt Factory is also two stories in height. There is a commodious dye house, one story high with a wide monitor on the roof, and a machine shop building as well as a warehouse at this mill.

The preparatory and spinning machinery used in Kilby Cotton Mill was built by H & B American Machine Co. Saco-Lowell Shops made the spoolers, warpers and slashers used in the mill. Weaving equipment consists of 336 Draper automatic looms. The Textile Finishing Machinery Co., Providence, R. I., supplied the dye plant equipment which includes an indigo warp dyeing outfit. Curtis & Marble Machine Co.'s equipment is used in the cloth room. In the shirt factory, the Reliance Manufacturing Co., of Chicago bought and supervised the installation of all equipment, and will also have charge of the sale of products of the shirt factory.

Kilby Cotton Mill and Shirt Factory is driven throughout by individual General Electric motors with hydro-electric power purchased from the Alabama Power Co., of Birmingham, Ala. The engineers in charge of the designing and erecting of Kilby Cotton Mill and Shirt Factory were J. E. Sirrine & Co., Greenville, S. C. The general contractors were Hugger Bros., Montgomery, Ala., while the electrical contractors were Mill & Mine Engineers, Birmingham, Ala.



Kilby Cotton Mill, at the State Prison, Near Montgomery, Ala. Part of the Shirt Factory is Shown on the Right.

Diversification of Southern Textile Industry

Increase of Fine Goods Weaving Plants, Bleacheries, Etc., the Outstanding Development in That Section in 1923—Signs Point to Further Expansion for Several Years—Controversial Question of "North vs. South" Has Been Emphasized Unduly in Consideration of the Growth of This Section

By *Dougles G. Woolf.*

ONE of the outstanding developments during 1923 was the continued expansion of the southern textile industry and particularly its diversification along new lines. Activity in that section has been so decidedly a matter of popular interest that a great deal of material has been either written or spoken on the subject of the relative advantages and disadvantages featuring textile manufacture North and South. Much of this material has been in the form of valuable statistical contributions but much has been of a controversial nature, reflecting the individual opinion of the source. As a result there has been considerable confusion, particularly in the public mind, regarding the status of the industry in the two sections and the prospects for the future.

What People Think

For example, the following beliefs have come into more or less general popular currency:

1. The New England textile industry is being rapidly moved to the South.
2. The northern manufacturers are cruel and inhuman—and are quite indifferent to the well being of their employes.
3. Plants which still persist in the North must eventually be scrapped and their owners transplanted to the Sunny South.

Or Else

1. The southern manufacturers are facing ultimate ruin if they continue to usurp branches of the industry in which they have had no experience.
2. The South is sugar-coating a low wage scale with so-called community developments — and the workers are being successfully fooled.
3. Southern labor is incapable of working on anything but coarse goods of staple variety.

What They Should Know

As a matter of fact, the following propositions are set down here as representing the truth of the stiuation:

1. With a few unimportant exceptions there has been no transfer of equipment from northern mills to the South—nor is much contemplated.
2. Expansion in cotton manufacturing in the last few years, however, has been almost entirely in the South. Northern mills have in several cases established branch plants below the Mason & Dixon line, or have become increasingly interested in enterprises there; while, to a greater degree, southern plants, locally controlled, have come into existence or have extended their operations.
3. Southern mills are branching out into nearly every phase of textile manufacture—and give every prospect of being successful thereat.
4. Northern manufacturers have had to contend with many adverse circumstances — chief among which was unsound legislation—but, given a little more public support, there is no reason why they should not hold their own.
5. The South on the other hand has not by any means reached the point of industrial saturation existing in New England—and it is safe to say that expansion in the former section will for years to come be more rapid than in the North.

"North and South"

These statements are made, not without fear of contradiction, but without fear of refutation. Their accuracy could be established by pages of statistical data and comparative facts—but this would duplicate whole volumes which have been printed during the last few years, most of which however have used these same facts on which to base faulty conclusions.

The trouble has rested largely with the general subject chosen: "North vs. South." If some one would start to investigate "North *and* South," a different end point might be reached. Each side is very largely ignorant of the other. To many northern boosters, the South is an unimportant adjunct to the New Engand textile industry. To an equal number of southern shouters, the manufacturer of the North seems to be tottering to inevitable extinction — and can never again hope to manufacture cotton goods so many miles from the cotton fields.

Possibly if the whole industry would shut up shop, and exchange locations for a while, they might be able to orient themselves more accurately. They would find that the great cotton manufacturing industry is divided approximately equally between the North and the South; that neither is a suburb of the other; that each section has its advantages and disadvantages; and that there is plenty of room for both.

What the South is Doing

Possibly the South needs more explanation than does the North. True, economists have flocked down there by the dozens — and have reported at a half-a-cent a word up, what they found. But the real textile developments in that section are still more or less of an unknown quantity to many in the North.

The first impression the visitor gets en route from Danville, Va., to Atlanta, Ga., is that the South is on a construction spree. Particularly in North Carolina is this evident. Every hundred yards or so, one sees a new mill or a new school or a new road or a new bridge.

But far more important than the quantity of building is its quality. There have been erected in the Southern States during the last year or two dozens of mills which are the last word in construction, in equipment and in arrangement.

The latter feature is possibly the most important. The outstanding material characteristic of the new southern plants is the provision made for continuity of operation—not only today but when expansion becomes possible and necessary. Many new mills have as much as twice the floor space they need at present, and in each case, the arrangement of the various departments is such as to permit the addition of more machinery in each, so that the new equipment will "tie in" with the old—and the succession of operations be unimpaired. This is an extremely important consideration because sad experience has often taught that old plants, in need of expansion, have had to be enlarged piecemeal with resulting decrease of plant efficiency.

Variation of Product

But far more significant than any material characteristic is the remarkable diversification of product of the southern textile industry. This has been talked of for years—but today is being realized. And the visitor becomes impressed with the fact that this movement has only just started and that future development in the South will be increasingly in this direction.

Many of the most important plants completed or

Getting In a New Stock of Goods.

started in 1923, and many of the extensions are planned for the manufacture of fine goods—fancy mixtures for dress goods, shirtings, drapery fabrics, etc. Just to mention a few of these, there are:

Cramerton (N. C.) Mills, Inc., whose new Mayflower Mills will produce fancy cotton dress goods and shirtings, plain and mercerized, and decorated in cotton, wool and silk. The initial installation in this mill is 500 looms but this will probably be increased by the same number each year for several years.

The Republic Cotton Mills, Great Falls, S. C., whose new No. 3 mill will manufacture fine cotton and silk mixtures for lingerie cloth. The loom equipment totals 1,000 and the plant will do its own silk preparing.

The Art Cloth Mills, Lowell, N. C., with an initial installation of 600 looms but with a capacity of 1,000—for the production of fancy cotton and silk dress goods, shirtings, drapery fabrics, etc.

Dunean Mills, Greenville, S. C., with new weave shed to house 600 additional looms for manufacture of fancy cotton and silk fabrics.

Judson Mills, Greenville, S. C., addition to weave shed and 700 new looms for producing fancy goods and handkerchief cloths.

Increased Use of Silk

These and other similar developments forecast a marked increase in the use of silk in the South—a fact which is being rapidly recognized by raw silk houses, silk throwsters, manufacturers of silk preparatory machinery, etc. At present, the production is almost exclusively of silk-mixed goods but it is not at all unlikely that all-silk fabrics will be produced in the South in the not far distant future.

In fact, the president of one of the companies mentioned above stated to a representative of Textile World that such a development was probable at his plant.

Bleaching and Finishing

Another feature of the southern expansion worthy of particular note is the increase in the number of bleaching, dyeing and finishing plants. Not only have separate organizations of this character been established but plants which did not previously do their own finishing are adding departments for such work, while others are extending this phase of their programs.

One of the most important bleacheries nearing completion in the South is the Southern Bleachery, Inc., at Taylors, S. C. This plant will start with an initial capacity of 1,250,000 yds., per week but with floor space sufficient for a production of 3,000,000 yds. per week as expansion of business necessitates. The most interesting feature about this new organization is the fact that it is planned for the processing of fine goods. Another important addition to these ranks is the Gregg Dyeing & Finishing Co., Graniteville, S. C. Still another was the completion of the Lowell Bleachery South at Griffin, Ga., for finishing of terry cloth and similar fabrics. Two other large bleachery projects were those of the Pacific Mills at Lyman, S. C., and the Ware Shoals (S. C.) Mfg. Co.

In this connection, two announcements of extreme significance were made within a few weeks of each other this fall. Early in December it became known that Joseph Bancroft & Sons Co., of Wilmington, Del., had purchased a site of 600 acres at Oldfort, N. C., about 35 miles from Asheville; and while no definite plans for the utilization of this site have been made public, it is known that it will eventually be the location of a southern branch of this large finishing organization.

Later in the month it was announced that the Sayles Finishing Plants of Saylesville, R. I., had acquired a site within a few miles of Asheville, N. C., and had definite plans for the erection of a bleachery and village, construction to start early in the year. Still another development of this nature materialized earlier in the year when it was announced that the United States Fnishing Co., had purchased the plant and real estate of the Blue Spring Dyeing & Finishing Co., at Cedartown, Ga., and had started large scale construction work for the improvement of the mill and village to be used as a southern branch. Thus three important finishing organizations of the North in addition to Pacific Mills have recognized the significance of the movement in the South pointing toward the local finishing of a greater portion of its product—and have taken steps to capitalize on this tendency.

In addition, the finishing facilities of many existing plants have been extended, and it is known definitely that projects are contemplated for the addition of such departments to mills which heretofore have not finished their own goods.

The possibilities of such a movement are tremenduous. It has been estimated unofficially that 2,000,000 yds. of goods are shipped each week from plants in the immediate vicinity of Greenville, S. C., for finishing up North. This gives an index to the potential finishing business in the entire South—particularly as the tendency toward increased production of fine goods becomes more pronounced.

Other Forms of Diversification

Nor are fine cotton goods weaving and finishing the only two branches which are being emphasized in the South. A noteworthy development was the establishment of the Southern Worsted Co., with plant at Greenville, S. C., for production of men's wear worsteds. While there has not been any general movement in this direction, the investment of joint northern and southern capital in an enterprise of this nature is a significant development for the future.

Then too, the southern knitting industry has expanded to a noteworthy degree. Existing plants have extended and new ones are being established. It was an open secret in the market this fall, for example, that southern ribbed goods sold much better than did those manufactured in New York State. In addition, there has been extension of the development of silk hosiery manufacture.

The mercerizing industry has also made great strides in the Southern States, and seems destined to develop further and more rapidly in the future.

Distribution Development

Hand in hand with this manufacturing expansion and diversification has gone an extension of distributive facilities in the South. An increasing number of machinery firms, for example, have recognized the growing potentialities of the market and have established new branch offices in that section or have enlarged their local service.

One interesting development centers around Chattanooga, Tenn. This city, in addition to enlarging its prestige as a knitting center, is becoming more and more an important yarn distributing center. Both northern and southern firms are establishing offices there.

The Labor Situation

No discussion of the southern textile industry is complete without some reference to its labor situation. The fundamental characteristics of the human supply in that section have been emphasized to a point of triteness but the fact still remains that this represents one of the greatest single advantages which the South possesses. This statement does not refer to the wage differential—nor to the discrepancy resulting from uneconomic legislation on hours of labor in Massachusetts.

There is a much more intangible condition in the South which becomes increasingly apparent to the northern visitor as he widens his acquaintance with southern mill towns. Briefly this may be described as community of interest. Much as this has been featured in discussions of the South, it must be emphasized that this does not fall into the "bunkum" class. There is a background of human relationship between management and personnel which evades monetary evaluation. This may be scathingly referred to as paternalism and may eventually produce a situation which will demand remedial efforts, but at the present time, the feeling between manufacturers and their employes must be placed entirely on the credit side of the southern ledger.

Possibly a little incident will illustrate this. A young office employe of a prominent southern mill showed the writer over the new plant being built there and interspersed his description with the most fulsome—and yet most evidently sincere—praise of the

GEOGRAPHICAL DISTRIBUTION OF TEXTILE INDUSTRY

In connection with the discussion of the relative development of the textile industry North and South which has been such an important feature during the last year, it is interesting to refer to actual statistics showing the geographical distribution of this industry.

The following table has been prepared by TEXTILE WORLD on the basis of the Government census report for 1919. The figures were obtained by striking an average between these three factors: Capital invested—Value of products—Value added to raw material by manufacture.

The table shows the percentage that each particular branch bears to the total textile industry; the percentage of the total industry located in the North and in the South, represented by each branch; and the relative proportion of each branch of the textile industry located in the North and in the South:

	Percent of Total U. S. Textile Industry Represented by each Branch.	Percent of Total U. S. Textile Industry Located in North Represented by each Branch.	Percent of Total U. S. Textile Industry Located in South, Represented by each Branch.	Relative Proportion of each Branch of Textile Industry Located in North.	Relative Proportion of each Branch of Textile Industry Located in South.
Cotton	42.0	23.00	19.0	54.8	45.2
Knit	14.0	12.38	1.62	88.4	11.6
Silk	13.0	12.7	0.3	97.7	2.3
Wool	26.0	25.7	0.3	98.8	1.2
Dye, finisn, etc..	5.0	4.5	0.5	90.0	10.0
Total	100.0	78.28	21.72	.....	.....

These figures show that more than one-half of the cotton branch and the great bulk of the other branches were located in the North in 1919. In view of the diversification of the southern textile industry now under way, as described in the accompanying article, it is to be expected that the percentages of the other branches in that section will have increased by the next census.

management and its ideals. Later the writer was told by the president of the company that the young man in question had been one of a large family of so-called "poor whites" who had farmed in that section before the mill was established, that the father had been pretty much of a ne'er-do-well; but that the boy had entered the mill school in the community and had shown remarkable promise. Needing an office worker, the president asked the principal to send him the brightest student in the graduating class. This young man was the one recommended—and had rapidly increased his knowledge of the business until he gradually became an important factor in the organization and earned a substantial salary. So thoroughly had the boy realized the opportunities which the mill offered to the people of the community—opportunities which had not existed before its establishment—that he became a voluntary press agent for the organization. The publicity which he gives the ideals of the management, particularly among the rank and file of the employes—could not be purchased for thousands of dollars. And yet it cost that mill nothing; in fact they have been receiving extremely valuable services from the young man as an office worker at the same time.

Possibly this illustrates one of the outstanding characteristics of southern manufacturing organizations—the practice of promoting from the ranks, of refraining to import men needed for positions higher up. This policy offers to the man at the machine the vision of an opportunity which makes his routine mechanical job seem less purposeless and which infuses him with the idea that the cotton industry offers sufficiently broad scope for his best efforts. Unfortunately such a condition is not always possible in northern plants because in many cases the character of the personnel does not warrant such wholesale promotion from the ranks.

Blasting a Tradition

This leads to a statement which deserves the most serious consideration by northern competitors of southern mills. The tradition that workers in the latter section cannot be trained to do other than routine jobs—or that such training represents too long a period of time or too much expense to be worth while—is basically unsound and is being rapidly blasted by developments in the South today. It is true that native manufacturers of that section have been more or less handicapped by this tradition in the past but they are rapidly losing that point of view and are capitalizing on the inherent ability of their workers. Any disposition to ignore southern competition in the manufacture of fine goods and novelties on the basis of supposed lack of trained labor, is dangerous ground. It is ridiculous to presume that Anglo-Saxons, rapidly acquiring more education—both of hand and mind—are incapable of learning processes which are being grasped by foreigners, handicapped by lack of knowledge of our language and ideals.

The diversification of the southern industry is being planned with the utilization of southern labor as a basis—and it is unwise to under-rate its possibilities.

Summary

This sketchy treatment of recent developments in the South is not written with an idea of exploiting that section or of "bearing" northern possibilities. The writer is a northerner who is not at all pessimistic as to the future of textile manufacture in New England.

As a matter of fact, the entire question of advantages and disadvantages of the two sections appeals to him as a more or less temporary subject of debate. We are not dealing with two separate countries with radically different basic conditions—but with two sections of the same country which, while possessing individual characteristicts, are so closely joined by commercial connections and by transportation facilities that points of difference tend to disappear instead of becoming emphasized.

Consequently it is but reasonable to suppose that, as the South develops more intensively, real estate values and construction costs will appreciate. Taxes must also increase as road building and expansion of educational facilities proceed. As for the wage differential, the theoretical $4.36 expended by manufacturers per employe per week for community developments, which incidentally is probably correct today in only part of the southern industry, will become more universal as employers are forced more and more to compete with each other for help. In fact this method of community development is one of the South's most complicated problems. It is true that it helps to strengthen the bonds between management and workers, but the economic difficulties attendant upon the distribution of a large and unprofitable village investment over operating finances are great. As pointed out in last year's issue of TEXTILE WORLD, this method of building villages and giving employes living, educational and social facilities at a nominal price is a characteristic of the southern section which was not voluntarily developed but was inherent in the history of southern cotton manufacture. New England manufacturers went through such a stage many years ago—and such a condition still persists in many sections. It is safe to say that northern mill men are not anxious to return to this procedure; and equally safe to say—after talks with far-seeing manufacturers—that southerners would welcome a solution of the problem of placing village activities on an economically sound basis.

As for hours, the disparity North and South persists on account of the lack of appreciation of industrial necessity on the part of the public and the law-makers of Massachusetts. The steady growth of southern mills should be the best argument in favor of early correction of unsound legislation.

In view of this probable equalization of manufacturing conditions North and South, the big question of the future does not seem to be permanently involved with the present debate of comparative costs in the two sections. The important consideration for all interested in the development of the American textile industry is that there is growing up in the South an efficiently manned and profitable group of mills, whose new and modernly equipped plants represent a permanent addition to the ranks of textile manufacture. The southern manufacturers have much to learn from their northern competitors, particularly as far as merchandising methods are concerned—but it is not safe to presume that they are incapable of achieving that knowledge. Neither is it safe for the South to presume that the advantages it enjoys at present entitle its manufacturers to ignore the competition of New England. Both sections are here to stay, and the problem of each is to make its products attractive enough and cheap enough to induce large-scale buying on the part of the public—and to increase the scope of its market by finding new outlets—both domestic and foreign—for its wares.

The mechanical and commercial effort which increasing southern competition necessitates in the North should prove beneficial in the long run. Furthermore, the enlarged buying power of the South, more prosperous today than at any time since the Civil War, will help business in both sections equally. Outside of temporary problems which this expansion of the American textile industry produces, there is nothing but benefit for those interested, not in sectional friction, but in two great parts of a great economic force.

Leak Manufacturing Company

New 17,000-Spindle Plant and Dye House at Rockingham, N. C., to Manufacture Chambrays

THE new textile development for the Leak Manufacturing Company at Rockingham, N. C., is one of the examples of a complete mill group which has been built in the South this year. This new company was organized and the mill promoted by the late T. C. Leak, who at the time of his death was also president of the Roberdel Manufacturing Company.

Located on the Hamlet Highway just outside of the corporate limits of Rockingham, this new 17,000 spindle mill is the most recent addition to Rockingham's already large textile group. In order that the engineers could handle the project from its very beginning, Robert & Co., Inc., architects and engineers, of Atlanta, Ga., were selected to supervise every feature of the complete program.

In deciding on a site an 80 acre tract was selected which was in close proximity to the town and other existing mills, as well as railroad facilities of both the Seaboard and Atlantic Coast Line Railroads. Looking to the future, provisions were made in laying out the initial mill for the second and third units.

The first unit of this development is to be a 17,000 spindle mill on chambrays, with 500 looms. In general the plant consists of a two-story main mill building, 125 ft. wide by 281 ft. long, with a weave shed in tandem, 125 ft. wide by 290 ft. long; a dye plant, machine shop, woodworking shop and boiler room.

All of the textile machinery is being furnished by Saco-Lowell Shops, with the exception of the looms which are being furnished by the Hopedale Manufacturing Co. T. C. Thompson & Bros., Charlotte, are the general contractors, and Robert & Company, Atlanta, Ga., are the architects and engineers.

Plant of Leak Manufacturing Company, Rockingham, N. C., to Make Chambrays

Government Cotton Reports and Forecasts

The Elaborate Organization Utilized — A Summary and Analysis of Methods Employed — Scientific Methods Gradually Displacing Judgment Reports and Ensuring Greater Accuracy — Comparative Accuracy of Production Forecasts and Estimates Claimed — Constructive Criticism Welcomed

By Dr. *Warren M. Persons* and Dr. *Carroll W. Doten* *

THE Department of Agriculture has been issuing reports on the cotton crop for fifty-seven years, the work having been begun in 1866. For nearly half a century, these were limited to reports on acreage planted, reports on the condition of crop once a month during the growing season as ascertained by inquiries from crop reporters, and to an annual report in December of acreage, yield-per-acre, and production.

The Government reports on condition of the crop made monthly during the growing season formed an important basis of forecasts made by farmers, dealers, and manufacturers, and the public at large who were interested in the cotton crop from the viewpoint of the relation of its comparative size to the probable market price. In other words, any one who had cotton to sell, or who wished to buy cotton, based his action upon his own forecast as to the probable size of the crop. Since a condition figure in comparison with past records does not tell the whole story of the probable size of the crop, there was naturally a wide range in these independent forecasts. This created a need for an official forecast, and the Department of Agriculture in 1915 began its forecasts of the probable outturn of the crop.

The first report on cotton for the current year relates to the condition of the crop as of May 25th. The first forecast is made as of June 25th and each month thereafter until October 25th. The report for this latter date was made for the first time in 1923. The production estimate based upon harvested acreage and yield-per-acre, is made early in December. This article will deal with the organization of the Division of Crop and Livestock Estimates, which makes these reports, and the methods which it uses in arriving at its estimates of acreage, condition forecasts, and production.

Origin of Crop Reporting

The Division of Crop and Livestock Estimates, which is a part of the Bureau of Agricultural Economics, is responsible for gathering and compiling the information used by the Crop Reporting Board in the preparation of its report. The Crop Reporting Board, through which the crop reports are cleared, was established in July, 1905, by an order of the Secretary of Agriculture. It is, at present, constituted of an Assistant Chief of the Bureau of Agricultural Economics, who is Chairman of the Board; the Statistician in charge of the Division; three other statisticians from the Washington office, and two or more agricultural statisticians called in from the field offices of the Division.

The Crop Reporting Board meets on dates selected and announced about the first of each year. These reports, which relate to the 25th of each month, are usually issued between the 31st of the same month and the 2nd of the month following. Seven regular reports are issued in all, in addition to which an "intention to plant" report was made last spring.

Great care is taken to prevent any one having access to the data used by the Board prior to the day of making the report, the information from various sources being kept in non-assembled form in a safe in the office of the Secretary of Agriculture. After the Board has taken its place in the rooms provided for it on crop report day, the windows having been sealed and the doors locked, with guards placed at each door, the reports and other data for the various States are brought from the Secretary's office in sealed envelopes. Once the doors are locked and the data received, no one is allowed to leave the room in which the Board and its assistants are assembled until the report has been released at the hour and minute set in advance for such release.

A penalty of ten years in the penitentiary, or a fine of $10,000, or both, is provided by law for the giving out of information by any one connected with the work prior to the time fixed by the Secretary for its release. Such persons are also prohibited by the same law from speculating in products of the soil.

In each of the sixteen cotton States, the Department has an agricultural statistician or field representative, and a small office force. These statisticians are well trained, experienced and familiar with local conditions. They spend from ten days to two weeks each month in the field studying conditions personally and developing the voluntary crop reporting force. These field representatives are in the classified civil service and, in order to qualify, must have been raised on a farm, or having had several years of actual farm experience, and in addition must have an education equivalent to graduation from an agricultural college and pass a rigid examination. One of these examinations was held a few weeks ago and only seventeen persons in the United States out of over eighty who took the examination were able to pass. The practice and policy of the Bureau are to select only men thoroughly familiar with the crops and the territory they will have to cover. Even if a man is well trained it requires at least two years' work in the service to make him a good judge of crops and therefore a good crop statistician.

The voluntary cotton crop reporters, who number thousands, and who serve faithfully year after year without compensation other than to receive the crop reports, a few bulletins, the yearbook, and formerly a few free seeds, are the backbone of the service. Many of these reporters have served for many years.

These voluntary reporters are classified in several ways. Those who report directly to Washington are of five kinds:

(1) 700 county reporters, each of whom maintains his own correspondents within his county.

(2) 7,000 township reporters, each reporting for a township.

(3) 5,000 special cotton reporters, who are bankers, cotton factors, etc., each reporting for his own locality.

(4) 12,000 individual farm reporters, each reporting for his own farm.

(5) 20,000 cotton ginners, each reporting for his locality.

The reporters who report to the field representative in each State are of three kinds:

(1) 10,000 field aids, each reporting for a township or smaller area.

(2) 5,000 special cotton aids, bankers, cotton factors, etc., each reporting for his locality.

(3) 25,000 individual farm aides, each reporting for his own farm.

The reports from these various groups are tabulated and handled separately. The Crop Reporting Board makes its estimates after a consideration of their reports and all other information collected from other sources.

That much of the recent criticism of the cotton crop condition reports and the acreage and production forecasts and estimates of the Crop Reporting Board of the Department of Agriculture has been based upon incomplete or inaccurate knowledge of this organization and the methods employed by it there can be little doubt. There is as little doubt that criticism is warranted, and that if it be based upon full knowledge of the facts involved it may be constructive and productive of beneficial results to the Board and the industry.

The Bureau of Agricultural Economics and the Crop Reporting Board welcome constructive criticism, and to make the latter possible have cooperated with the editors of Textile World in persuading the eminent economists and statisticians, who are the authors of this article, to prepare this authoritative and clear presentation of facts covering the Board's organization and methods. Both are members of the Advisory Statistical Committee on Crop Reporting Methods. Dr. Persons is editor of the Review of Economic Statistics, published by the Harvard Committee on Economic Research, and Dr. Doten is professor of economics at the Massachusetts Institute of Technology.

Forecasts and Estimates

In the final analysis, the significant thing in crop production is the size of the crop, i. e., the number of bales of lint cotton produced, or to be produced. Production estimates refer to the size of the crop when it, the crop, is an accomplished thing. Production forecasts refer to the expected size as measured while it is still growing and subject to the various influences which may reduce or enhance it. The size of a crop varies with the acreage harvested and the yield-per-acre; the expected size with the acreage expected to be harvested, and the expected yield-per-acre. Variation in acreage is separate and distinct from variation in yield-per-acre. The determination of each will be discussed separately.

Acreage Estimates

The determination of the acreage, not only of cotton, but of other crops, and the accurate measurement of the changes from year to year, constitute one of the most difficult problems confronting the statisticians in the Department in their work of crop forecasting and estimating. Experience has demonstrated that no one method has yet been devised that is always infallible, but real progress has been made in recent years in working out methods which give the facts with a reasonable degree of accuracy.

In arriving at its estimates of acreage, the Department has developed a series of indications of absolute acreage and of acreage change, all of which are given consideration, and to some extent are weighted according to the degree in which they have

*Members of the Advisory Statistical Committee on Crop Reporting Methods, U. S. Department of Agriculture.

proven reliable in the past. Before describing briefly some of these methods, it is brought to the attention of the reader that the primary basis for most of the acreage estimates of the Department for cotton and other crops is the decennial Census of Agriculture. The Department estimates the changes in acreage from year to year between the Census periods. In the case of cotton, however, enumeration of the bales of cotton ginned is made each year by the Bureau of the Census, Department of Commerce, and serves indirectly as an annual check upon the acreage, for if the yield-per-acre can be determined with a fair degree of accuracy, the acreage can be determined by dividing the pounds of cotton ginned by the average yield-per-acre. As a matter of fact, this is what is done each year in arriving at the final estimate of acreage harvested in each crop.

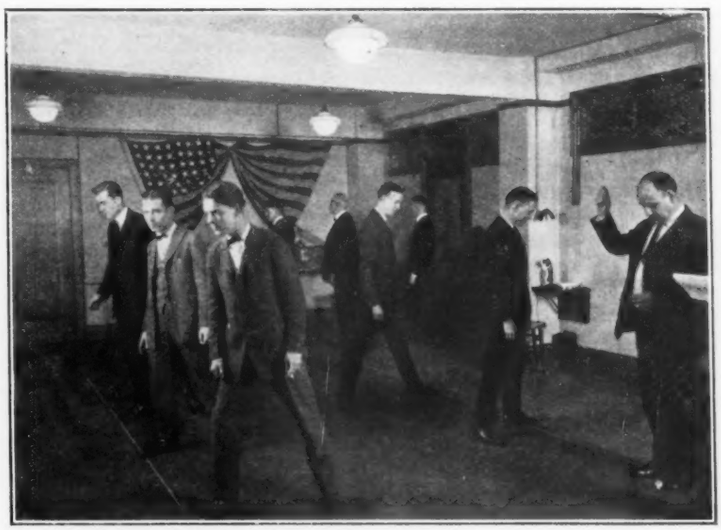
For the crop of any given year, the first estimate of acreage is made as of June 25th, and relates not to the total acreage of cotton planted that spring, but to the acreage in cultivation on June 25th. The acreage abandoned prior to that time is not included in the estimate and no estimate of abandonment prior to June 25th is made.

The abandonment of acreage reported by the Department each year refers to the acreage which was in cultivation on June 25th, and which was subsequently abandoned; that is to say, the acreage from which no cotton whatever was picked. As previously mentioned, the final estimate of acreage harvested, made the following May, is based indirectly upon the Census final ginnings; the amount of abandonment in that year is added to the acreage harvested to secure a revised final estimate of the acreage in cultivation on June 25th, of the preceding year. The acreage in cultivation on June 25th of the current year is determined as a percentage of this final acreage of the previous year.

The Various Judgment Inquiries

For many years prior to about 1915, the Department relied for its estimate of change in acreage largely upon a judgment inquiry to the various lists which read as follows: "What is the present acreage of cotton in your locality compared with the acreage a year ago (representing the acreage a year ago by 100%)." This method was never very satisfactory. It required only a few years' experience with it to demonstrate that there was a strong disinclination on the part of the reporters to report over 100%. Consequently, allowance had to be made for this weakness in the reports. This question is still asked and allowance is made for the weakness, but generally speaking, very little reliance is now placed on the method.

In order to overcome the tendency to report below 100, which was noted above, during the first decade of the present century a companion judgment question was added which read as follows: "What is the present acreage in cultivation compared with the usual acreage in your locality (representing usual acreage by 100%)." Returns to this question also tended to fall below 100. When the returns to this question for the current year were compared with the returns to the same question in the preceding year, both were compared with the same measuring stick, the rather indefinite "usual acreage." For example should the returns for last year be given at 88% and for this year at 97%, the indication would be that the actual acreage was 97-88, or 110%. This indication has proven useful where agricultural practices are well established and rather stable. The method of its use overcomes the statistical handicap of the tendency of reporters to report below 100. Its weakness lines in the fact that while it usually indicates the direction, it does not always measure the full magnitude of change. Moreover, in States which are making rapid growth in crop area, or where large shifts from one crop to another are the customary thing, the assumption of "usual acreage" as a common measuring stick is invalidated.



Press Representatives 15 seconds Before Release of Cotton Report 2 P. M. Dec. 12.

A third inquiry, in which the crop reporter is asked to give his judgment as to the acreages in his locality, is the inquiry on the acreage in cultivation per 100 acres in crops. Such an inquiry reads as follows: "Of every 100 acres of crops in your locality, how many acres are in corn, wheat, cotton," etc. Main crops only are included. Weighted reports are summarized as to the average number of acres per 100 in each of the main crops. Comparison is made with returns to the similar inquiry in the previous year. For example, if 44 acres of every 100 acres in all crops were reported in cotton this year, and 40 acres last year, the indication would be that the acreage this year was 110% of last year.

The Sample Data Method

In 1914 the Department began the collection of sample data to assist in measuring the changes in acreage from year to year. The voluntary crop reporters (all lists) were asked to report acreage on their own farms.

Year to Year Relatives

Inasmuch as the purpose of the inquiry was to determine the change in the acreage from the previous year, the reporter was asked to give the acreage on his farm not only for this year, but also the acreage for last year. If for a given State, for example, 44,000 acres in cotton were reported on the sample farms this year as against 40,000 acres last year, the indication would be that there was a 10% increase. When the year to year relatives (percentage of change from previous year) are compared with the year to year relatives of the final estimates based indirectly upon the Census ginnings figures, it is noted that there is a relatively constant difference between the two series. There appears to be a tendency for reporters to overstate the acreage in cultivation last year. Whether this over-statement is due to forgetting, or to the fact that the reporting farmers do not make changes in acreages in the same ratio as farmers as a whole, the Department has no means of ascertaining. The significant thing, of course, is the fact that the divergence of the sample from the whole is relatively constant and can be measured with considerable accuracy.

The Objective Acreage Count

During the past few years, the Department has attempted to obviate the difficulties of securing acreage estimates either by the use of judgment estimates of reporters or by the individually reported sample data method by means of objective acreage counts. As early as 1915 one of the field agricultural statisticians in the Southern States began the systematic counting, year after year, of the actual fields planted to cotton over identical routes through representative portions of his State in successive years. If, for instance, in a thousand miles of travel, the statistician counts 4,400 fields of cotton this year, whereas over the same route last year he found only 4,000, the indication would point to a 10% increase. A refinement on this method necessitated in some cases by the fact that fields are not always of the same size, was the counting of the telephone poles opposite the fields in cotton (and other crops). The absence of poles along many highways in the states has brought forth during the past year a further refinement in the form of a multiple roadmeter attached directly to the distance measuring device of an automobile by which the actual frontage in the various crops is recorded. The Department is very hopeful that this objective method will give indications free from the weaknesses mentioned in discussing the judgment and sample data methods of securing indications of acreage change. It will take a number of years' records to establish the relative accuracy of this method.

Other Indices of Acreage Change

A further indication of acreage change in cotton plantings is secured from the records of fertilizer sold in the Southern States. In nearly all of the Southern States, each bag of fertilizer sold must have attached a tag purchased from the State Department of Agriculture. In June, estimates are secured from crop reporters as to the amount of fertilizer used per acre, the relative proportion used on cotton, and the percentage of cotton fields receiving fertilizer. By a composite of these latter indications, another estimate of the acreage of cotton this year compared with last year is obtained.

Two further indications of the acreage charge are obtained from a study of the acres per plow, which in the old cotton belt means one negro laborer, one mule, and one plow, and from a study of the reported acreage in corn, which over much of the cotton belt is a complementary crop to cotton. If one increases, the other usually decreases.

After a consideration of these eight indications, the Crop Reporting Board arrives at an estimate of the acreage in cotton in cultivation on June 25th compared with the acreage in cultivation on June 25th last year. This estimate is often called for brevity the "planted acreage," and is the acreage base to which the forecasted yield-per-acre is applied in computing the production forecasts issued by the Department during the growing season.

Determining Harvested Acreage

The harvested acreage of cotton, which means the planted acreage minus the abandonment of acreage subsequent to June 25th, is estimated for use in the December report. In arriving at this estimate the Department uses methods like those used in making the estimate of planted acreage. In December the three judgment inquiries,—on acres of

cotton harvested compared with acreage harvested last year,—on acreage harvested compared with usual acreage harvested,—and on acres harvested per 100 acres of all crops harvested, are made of the various lists of reporters. Sample data on individual farms are secured on a general inquiry which covers not only cotton but all other crops. This inquiry is made about September 15th at a time when practically all of the abandonment has been determined. Acreage counts for the entire season, fertilizer records for the entire season, acres per plow and acres in corn, are also available at that time. In addition, the Department estimates the abandonment of cotton acreage from a judgment inquiry on the percentage of the cotton acreage which has been abandoned subsequent to June 25th. This abandonment, subtracted from the planted acreage, gives a 9th indication for the acreage harvested. There is also a 10th indication which will be discussed a little later.

In determining the expected yield-per-acre for use in forecasting the cotton crop, the Department so far has employed the method of condition and pars. Forecasts are really interpretations of the currently reported condition of the crop expressed as a percentage of the normal condition. Each month during the growing season the crop reporters are asked to estimate the condition of the crop on that date as compared with the normal condition on that date. Briefly, the normal condition which the crop reporter takes as 100% is a state of growth and progress of the crop which would result in a full yield-per-acre should conditions from the given date until harvest be average. The normal crop is therefore a full crop; the normal condition one which from its present state of growth and progress promises a full crop. The term "normal" as used by the Department has been criticized on the ground that it has no definite statistical basis and therefore by itself cannot convey any meaning. It has been found however that the crop reporter has a well defined judgment of what constitutes normal for his locality. Moreover, the normal has been found to be a very stable figure. This is evidenced by the agreement of the returns received by the Department from its various independent lists. For example, during 1923 the extent of the agreement between the two major lists, township and field aid, for the four dates, for the 10 principal States, was as follows: no difference—none; a difference of 1 point—11 reports; a difference of 2 points—6 reports; a difference of 3 points—6 reports; a difference of 4 points—7 reports; a difference of 5 points—4 reports; a difference of 6 points or more—6 reports.

A similar stability from year to year within a given State is noted when the 100% equivalent of condition or the mathematical interpretation of the normal crop is computed. Such a computation will be shown a little later when the subject of pars is discussed. It is significant that even though the normal may be said to be evasive and indefinite, crop reporters do understand the term and are able to make comparisons with it.

The expected yield-per-acre from a given condition on a given date is interpreted on the basis of the relation in past years of condition on that same date to the yield-per-acre. In the past, given condition has been accompanied one year by a certain yield-per-acre and in another year by another yield-per-acre. In one year subsequent weather and other influences were more favorable than average and caused an improvement before harvest; in another year these influences were less favorable than average and caused a decline. In the interpretation of condition, the mid-road is taken and a yield is determined that may be expected should these influences be average. As a matter of fact, these influences are seldom average. Consequently, the realized yield is practically always somewhat above or somewhat below the forecast. In the long run the yield should be above as often as below.

The Determination of Pars

In the interpretation of the current condition into forecasted yield-per-acre, the Department uses what has been called the method of "pars." The par for a given date is a mathematical expression of the reporter's concept of a 100% condition. In other words, the par for a given date is the yield that might be expected had condition been reported as 100% of normal.

In a table given below is shown the condition of cotton as reported for the State of Texas from 1909 to 1922, together with the realized yield-per-acre:

Table I. Texas, Cotton, Condition and Yield, 1909-1922

	Condition					Yield
	May 25	June 25	July 25	Aug. 25	Sept. 25	Pounds
1909	78	79	70	59	52	172
1910	83	84	82	69	63	140
1911	88	85	86	68	71	192
1912	86	89	84	76	75	206
1913	84	86	81	64	63	157
1914	65	74	71	79	70	183
1915	79	82	76	67	57	149
1916	78	81	78	66	63	157
1917	74	72	68	56	53	135
1918	82	84	61	43	44	110
1919	76	69	67	61	52	125
1920	60	71	74	67	61	160
1921	71	72	62	42	38	96
1922	61	72	72	59	52	120

It will be noted that condition, as reported in the table above, differed at each date and usually declined as the season advanced. This decline in reported condition as here shown is typical for other States and for other crops. Attention is directed to a point which is fundamental in determination of crop pars. The yield-per-acre of cotton in Texas in 1922 was 130 lbs. This yield accompanied a reported condition on May 25th of 61%, on June 25th of 72%, on July 25th of 72%, on August 25th of 59%, and on September 25th of 52%. Judging from this one year's experience therefore, with a different condition reported for each date, we would have a different par for each date. If a reported condition of 61% on May 25th was accompanied by a yield of 130 lbs., then a reported condition of 100% might be expected to have been accompanied by a yield of 130/61, or 213 lbs. This is the computed par for May 25. Similarly, if a reported condition of 52% on September 25th was accompanied by the same yield of 130 lbs., then a reported condition of 100 might have been expected to have been accompanied by a yield of 130/52, or 250 lbs. This is the computed par for September 25th. Note that the lower the reported condition, the higher the par.

In the table below are shown the computed pars derived from the figures shown in the preceding table:

Table II. Texas, Cotton, Computed Par, 1909-1922

	Equivalent of 100%				
	May 25	June 25	July 25	Aug. 25	Sept. 25
1909	169	167	189	224	254
1910	180	177	182	216	237
1911	218	226	223	282	270
1912	240	231	245	271	275
1913	187	183	194	246	248
1914	282	247	258	232	261
1915	189	182	196	222	261
1916	201	194	201	238	249
1917	182	188	199	245	256
1918	134	131	180	256	250
1919	164	181	187	205	240
1920	267	225	216	229	262
1921	135	133	155	229	253
1922	213	181	181	229	250

It will be noted that the indicated pars for June 25th ranged from the low figure of 131 lbs. in 1918 to a high figure of 247 lbs. in 1914. This range of 116 lbs. when divided by 2 gives an indication of the extent to which the yield-per-acre for a State may vary from the yield forecasted from condition on May 25th. (The par for June 25th has been about 185 lbs.). In 1918, weather and other influences upon the crop were less favorable than average, while in 1914 they were more favorable than average. It will be noted that the range in subsequent months was smaller. This is to be expected since fewer things may happen to the crop between each successive date and maturity. It will be noted that the range for Sept. 25th was from 237 lbs. in 1910 to 275 lbs. in 1912. Since the amount of deterioration or improvement after Sept. 25th of the cotton crop in Texas was relatively small, the figures shown for this date practically indicate the computed par at the time of harvest. This illustrates the point brought out in the discussion of condition that crop correspondents do know what is meant by "normal," are able to make comparisons with it, and have in mind a rather stable concept of a full crop.

In determining the crop par, the statisticians of the Department make use of the computed pars for individual years as shown above, and also a 3-year, 5-year, and 10-year moving average of these pars. The trends toward a higher or lower concept of normal are indicated by these averages. The 5-year moving averages of the above figures are shown.

It will be noted in Table III. that there is a distinct trend toward a lower indication from the computed pars for the earlier months, but only a slight change in the computed pars for the latter months.

The pars adopted by the Department for Texas for use in 1923 were as follows: May 25th, 190; June 25th, 182; July 25th, 195; Aug. 25th, 230; Sept. 25th, 253. It will be noted that the par increases as the season advances. As previously stated, this is due to the fact that, generally speaking, the reported condition declines as the season advances. This explains why it is possible for a decline in condition to be accompanied at times by an increase in the forecast in yield-per-acre. Such a seeming paradox occurs whenever the decline in condition is less than the increase in par.

There is a close relation between the decline in condition and an increase in the abandonment of acreage. In other words, where the condition of cotton becomes very low, the quantity of cotton produced per acre becomes so small that in some cases it does not pay for picking. Because of this fact, where the condition is reported to be very low, the Crop Reporting Board must make allowance for the area which will probably not be picked. Beginning with 1924, it is planned to make a monthly inquiry on the percentage of acreage abandoned to assist the Board in making allowance for this factor.

Accuracy of Forecasts

Forecasts of cotton production have been made by the Department since 1915. During that period, the crop has varied in size from 7,954,000 bales to 13,440,000 bales. The largest crop was 169% of the smallest

Table III. Texas, Cotton, 5-Year Averages, 1912-1922

	Equivalent of 100%				
	May 25	June 25	July 25	Aug. 25	Sept. 25
1912-16	218	206	217	239	257
1913-17	206	197	207	234	253
1914-18	197	188	206	238	256
1915-19	173	175	182	233	250
1916-20	190	184	197	237	251
1917-21	176	172	187	235	252
1918-22	183	170	184	230	251

crop. A summary of these forecasts is shown in Table IV. It will be noted that the July forecast averaged 8% above the final outturn; August forecast 6% above; the September forecast averaged the same, and the October forecast 3% below. As previously stated, the Department expects to be above or below the final outturn depending on whether subsequent influences tend to be more or less favorable than average. Note that this is what actually occurred for the September forecast. The forecast was above four times and below four times. Further, the extent to which the forecasts were above was the same as the extent to which they were below. For the earlier months, the forecasts have been above six times, and below twice. This would indicate that during the eight years for which the Department has made forecasts subsequent influences were less favorable than average.

In justice to the Department, and not at all as an alibi, consideration must be given to the fact that the period from 1915 to date has been as a whole characterized by violent declines in crop condition as the seasons advanced. It must be remembered that a material change has occurred in the growing of cotton with the extension of boll weevil infestation over practically the entire cotton belt.

certain terms, particularly during the past few years. There are those who maintain that no forecast whatever should be made. But forecasts are being made constantly by everyone interested in the crop. As mentioned in the first paragraph of this article, every buyer and every seller of cotton must make his decision on the basis of what he thinks will happen. To discontinue the Government forecasts would again re-establish a wide range of interpretation of current indications, and tend toward an even less stable condition in the marketing of cotton.

In this connection, it is significant to note that the committee of cotton planters, dealers, manufacturers, and farm editors which recently considered the cotton reports of the Department, recommended among other things *more frequent* cotton crop forecasts during the growing season.

Production Estimate

The production estimate, as distinguished from a production forecast based upon condition, is made about December 10th of each year. At that date, the crop is practically made. The determination of acreage picked has already been discussed. On December 1, the various lists of reporters, with the exception of the individual farm lists, are asked to give a judgment figure of the average

Table IV. Comparison of Cotton Forecasts and Final Ginnings (000 omitted)

Year	July Forecast *Bales	A %	B %	August Forecast *Bales	A %	B %	September Forecast *Bales	A %	B %	October Forecast *Bales	A %	B %	December Forecast *Bales	A %	B %	Final ginnings reported by the Census *Bales
1915	12,381	11	..	11,876	6	..	11,697	5	..	10,950	..	2	11,161	same		11,192
1916	14,266	25	..	12,916	13	..	11,800	3	..	11,637	2	..	11,511	1	..	11,460
1917	11,633	3	..	11,949	6	..	12,499	11	..	12,047	7	..	10,949	..	3	11,302
1918	15,327	27	..	13,619	13	..	11,137	..	8	11,818	..	2	11,700	..	3	12,041
1919	10,986	..	4	11,016	..	4	11,230	..	2	10,696	..	6	11,030	..	3	11,421
1920	11,450	..	15	12,519	..	7	12,783	..	5	12,123	..	10	12,987	..	3	13,440
1921	8,433	6	..	8,203	3	..	7,037	..	12	6,537	..	18	8,340	5	..	7,964
1922	11,065	13	..	11,449	17	..	10,575	8	..	10,135	4	..	9,964	2	..	9,762
Average	11,943	8	..	11,693	6	..	11,095	same		10,743	..	3	10,955	..	1	11,070
1923	11,412	..	..	11,516	..	..	10,788	..	..	.....	..	..	.....	..	..	.....

*Per cent of increase or decrease compared with final ginnings: A—Above final ginnings. B—Below final ginnings. *500 pounds gross weight bales.

Using Independent Data

As frequently mentioned in this article, forecast of yield-per-acre is an interpretation of an observed condition of the crop at intervals of a month during the growing season. Some progress has been made in the actual forecasting of the yield-per-acre based upon the study of independent factors such as weather during critical periods of the crop growth, the relative number of boll weevils present, etc. Such forecasts, however, have been made for limited areas only. It must be noted also with reference to cotton that the effect of weather upon crop yield is complicated by the effect of weather upon the boll weevil. Any attempt to forecast yield-per-acre of cotton must take this into consideration. The possibility of making forecasts from independent data is being studied and will continue to be studied within the Department, and if in the future it appears that a closer approximation to the probable outturn can be secured from such sources, they will be utilized in making of forecasts.

The Department's production forecasts have been criticized in no unyield of lint cotton per acre in their locality. The individual farm reporters are asked to report the average yield of lint cotton per acre on their own farms. From this material the Crop Reporting Board makes its estimate of the average yield-per-acre for each State. At the same time, reporters are asked to estimate the percentage of the acreage in cultivation on June 25 which was subsequently abandoned. Such information is not secured on a sample data basis from individual farms. The experience of the Department has been that in the case of a relatively high abandonment those individuals suffering the most fail entirely to make a report. Consequently, reports on abandonment of individual farms do not accurately measure the fluctuations in abandonment.

In its estimate of production made in December, the Board uses five separate indications of the total size of the crop. The first of these is the acreage harvested times the average yield-per-acre. The second is the acreage in cultivation on June 25 less abandonment times the average yield-per-acre. As previously discussed, acreage harvested is determined each fall from similar sources, but independently from the acreage planted as determined in the spring. The third estimate is based upon the report of cotton ginned prior to December 1 as made by the Bureau of the Census, converted to 500-lb. gross weight bales, divided by the estimated percentage ginned to December 1. The estimated percentage ginned to December 1 is based upon reports from the ginners' list to an inquiry in which they are asked to estimate the percentage of cotton ginned to December 1. The current estimate is modified according to the divergence of this estimate in past years from the actual percentage ginned prior to December 1 as reported by the Bureau of the Census, after the ginnings are completed. The fourth estimate is based upon a study of the relative exhaustion of ginnings. It has been found that there is a rather significant relationship between the quantity of cotton ginned for the period November 14th to December 1 and for the balance of the season. An estimate of the quantity of cotton still remaining to be ginned is made from this study and added to the Census report on bales ginned to December 1 converted to 500-lb. gross weight bales.

The fifth independently computed estimate of the size of the crop in bales is the estimate made independently from similar sources by the field statistician in each State. Ordinarily, there is a very close agreement between the independent estimates from the five sources. The Crop Reporting Board, after a full consideration of this information adopts a figure which represents the best interpretation of the Board as to the probable size of the crop.

From Table IV, it will be noted that during the past eight years this estimate has been below the final ginnings four times, has been above the final ginnings three times, and has been the same once. The largest over-estimate was the 5% over-estimate in 1921. On an average, the estimate for the eight years was 1% below the final ginnings. With the gradual development of improved methods of estimating acreage, forecasted yield per acre, and total production, the Department is confident that the margin of error between its forecasts and production estimate and the final ginnings can be materially reduced.

In the discussion under acreage estimates, the 12th indication of acreage was mentioned but not discussed. This indication is the quotient derived by dividing the December estimate of pounds of cotton produced by the average yield-per-acre for each State. The final revised estimate of acreage is made in the spring of the following year and is published about June 1st. It is based upon a reconsideration of the average yield-per-acre as affected by information received subsequent to the December 1st report. As a rule, however, it is seldom that any change in this yield is made. The acreage is then determined by dividing the total pounds produced in each State as reported by the Census in its report as of March 1st, by the average yield-per-acre. As previously mentioned, the revised acreage in cultivation on June 25th is determined by adding to the harvested or picked acreage the acreage abandoned subsequent to June 25th.

Intentions to Plant

The Department of Agriculture, while created to serve the public at large, has a special duty of serving the farmer. Production estimates and forecasts of production are of value to the farmer in aiding him in making decisions with regard to the selling of his crop. In other words, they aid the farmer in solving his marketing problem. They are, however, only indirectly helpful to him in solving his production problem. His decision as to whether or not he shall increase or decrease the acreage planted to a particular crop (cotton in this instance), is determined to a considerable extent by the current market price of the commodity. In order to provide more timely and direct aid to the farmer in arriving at his decision with regard to planting, the Department in 1923 began the issuance of reports on intention to plant. The first report of this nature was issued on April 20, 1923. The Department realizes that this report should be issued at an earlier date, and it is planned in the future to issue it about the first of March. The report on farmers' intentions to plant is not an estimate of acreage. It is a mere statement of the extent to which farmers plan to increase or decrease their acreage in the specified crops. The figures reported represent what a large list of farmers stated their plans to be for the current year's planting in relation to the acreage which they planted the previous season. The returns of course are duly weighted according to the area in the crop the previous year. The purpose of the report is to give farmers an opportunity of revising their intentions with regard to certain crops should the report indicate that there is danger of either over-planting or under-planting.

Welcomes Constructive Criticism

As members of the Advisory Statistical Committee appointed by the Secretary of Agriculture to consult with the statisticians of the Department on crop reporting methods, the writers have been favorably impressed with the character and integrity of the personnel of the Division, and of the Crop Reporting Board. This committee, in its two visits to Washington, was also favorably impressed with the methods employed by the Department in making its estimates of acreage and production, and with the constant efforts which are under way to improve the service. It also found the personnel of the Division keenly receptive to suggestions where improvements might be made.

Specialties Lead Women's Fabrics for 1924

Plaid Vogue in All Divisions of Women's Dress May Extend Into 1925—Soft Treatment of Quieter Colors Best for Exclusive Trade—Sports Motif is Strong—Use of Hand-Loomed Tweeds in Fashion Circles Suggests Return to Popular Favor Next Year—Prints in Silk Field Much Diversified

By *Helene Volka* *

THAT which may safely be termed the dramatic element which has characterized the designing of de luxe woolens in the last two years, shows no sign of relaxing its hold upon the taste of the discriminating consumer. And, in spite of the obvious risks which must always accompany the production of these specialties, both foreign and domestic collections maintain for the spring of 1924 a brisk and exhilarating quality in the styling, with only slight reduction, as compared with recent seasons, of the quantity of novel designs submitted.

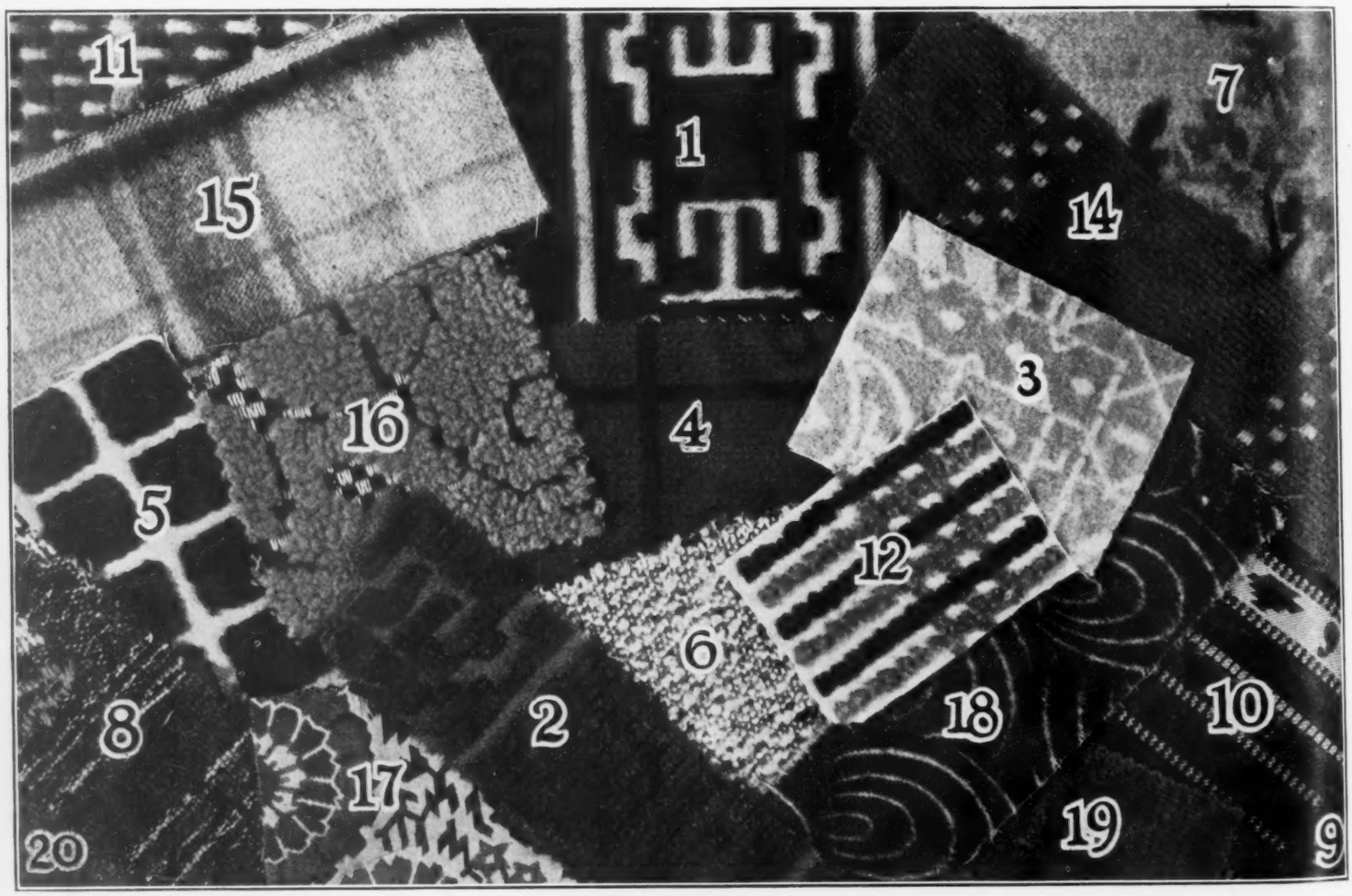
Patterns of special appeal to the temperament of the French designer continue to derive their basic motifs and textures, as well as their romantic names, from the Far East. Complex interrelation of lines is one outstanding feature of these motifs, which are frequently interpreted with the feeling of embroideries and the primitive hand-woven decorative textiles. In this series, the rectangular form of design largely prevails, and, moving in harmony with the current French theory which presents a dark or multi-color blending upon a light base, is found to be especially pleasing to the Haute Couture when developed in relation to the "unbleached" ground tone. The small solid-color blocks, or "bricks," of last year's Agnella coatings, are this season larger in size and shown as "marble" or "tassellated" effects, in extreme light and dark contrasts. Brilliant colors blended with the dark shades, as in the Pavellaine series, show the block in red, green-gray and dark brown on a natural camel's hair ground. These designs, which have already enjoyed considerable success in the foreign market, are opened up for spring in the piece goods departments of a number of Fifth Ave. stores, thus substantiating the expectation that blocks will hold their own against the plaid activities, which, it is predicted, will run well into 1925.

* Fashion Service Department of Botany Worsted Mills.

Position of Decorative Fabrics

That the plaid vogue has reached the point of an overwhelming popularity, being adopted from "head to heel," literally, from millinery to hosiery, gives evidence of the successful campaign inaugurated two and a half years ago. Not only the ancient clan patterns have been brought into line, but the fabrics which for decades were invariably associated with them are also revived with prestige. Woolen plaids, printed and woven, are therefore, at the moment, equally successful, whether from the standpoint of practical sports, utility wear, or in the realm of exotic fashion.

Equally successful in the ready-to-wear and the piece goods departments are both the soft neutral shades and brilliant colors. James Ryan, piece goods buyer for John Wanamaker, had interesting statements to make upon his return from a European buying trip early in January, concerning the scope of plaids in high-grade productions. "As the New York buyer who first looked upon plaids as a certainty, I last year proved my faith in them by laying in a stock, both foreign and domestic,

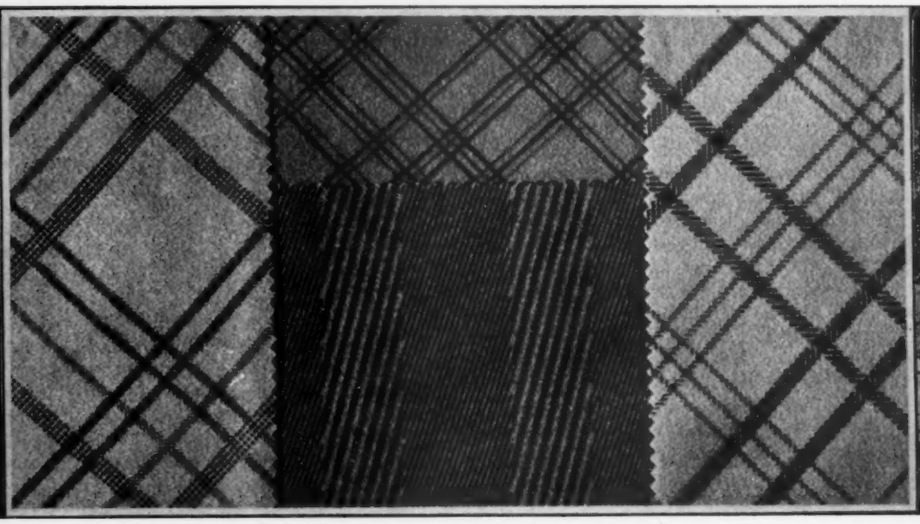


Courtesy of Botany Fashion Service Dept.

TYPES OF FOREIGN NOVELTIES WHICH HAVE SCORED FALL AND WINTER SUCCESSES IN AMERICA.

1 and 2, Les Pekins Raillaine Damasee; 3, Kashavella de Langbien; 4, 14, 18 and 19, Velcurs Marechal Series; 5, Paves Agnella Marbres; 6, Marokaia; 11 and 12, Pavellaine Multicolore; 8, Marokellaine de Sedimah; 9, Agnella Jaspe; 10, Cashemire de Serbas; 16, Floragnella; 7, Fleuris Kashavella; 15, Kasha Quadrille; 17, Cachemire de Coran; 20, Marokellaine.

A printed black pattern on white flannel is here managed with exceptional skill in the balance of light and dark sections. A silver cord outlines the cut-out design of the border and sleeve sections. Designed for the Model Makers' show at the Ritz-Carlton for Botany Worsted Mills by Marion Stehlik.



FLANNELS IN THE LIMELIGHT

In a leading position in both sports and semi-sports wear, high-grade flannels introduce many novel printed designs. In their collection of new patterns opened for mid-summer, Botany Worsted Mills submit printed plaids and novel stripes, which reveal a wide array of colors in combination, besides the Botany Sports Stripes, the new name for the old blazer stripes.

The black and white vogue in flannels is of such extent that it presents all of the design value of broadcloth when handled as above, with applique of black outlined in high-glaze silver embroideries on white. Designed for the Model Makers' Show at the Ritz-Carlton for Botany Worsted Mills by Marion Stehlik.

of widely varied patterns. In many cases, I ordered exclusive color combinations and although in the beginning the response was from those in search of advanced fashion, by the fall of 1923, the tide turned so completely in the plaid direction, from the popular standpoint, that the demand suddenly exceeded the supply of the American mills. From this time on, the plaids of my department supplied both the consumer direct and a number of manufacturers of coats, suits and dresses who had learned of the special color combinations which had been developed in these desirable fabrics. From my own personal standpoint, having witnessed the shaping up of this demand, I would say that the market will now break in two directions. As the spring season advances, the popular trade will exhaust all of the extreme colors and the large patterns. The return of the finest hand-loom fabrics in quiet colors which are, however, far from dull, will then advance plaids in the direction of the exclusive trade."

Plaids Gain in Softer Colors

In showing this newer color range, Mr. Ryan dwelt particularly upon the softest browns as an important group. Subdued yellows, a light rust and the new shade known in the European markets as woodcock, a "rosy brown" of very special appeal, are, with a revival of an interesting ashes of roses cast, the leading color trends in distinctive sports dress, utilized in two-tone effects. Not only does Mr. Ryan support the return of the mannish tailored suit, but furthermore shadows, and the natural phenomena of sea and sky for the reproduction endorses the highest grade of luxurious Saxony tweeds as the logical turn in the steadily advancing sports movement.

To this end, many striking patterns are included in the new Wanamaker collection, in particular, a series which employs large block designs lightly worked up in fine nubs by strongly contrasting the ground tones—black on white and brilliant color on white obtaining equally striking effects.

"Among the traveled class of Americans who have lived much abroad, home-spuns are a tradition and a year 'round necessity," continued Mr. Ryan. "The younger generation which stays at home knows little or nothing of these traditions, but at the present time is beginning to demand quality on its own account as the mark of the well-dressed. For these there are new colors which are especially youthful and new in homespuns. Among them, perhaps a fine cochineal red is most striking, while cinnamon, pomegranate and copper shades, pumpkin yellows, new greens and blues complete the list. Tans, not grays, are unmistakably to be the leading demand for those who prefer the neutral shades in homespuns. Fleece-face Irish and Scotch productions, among the most satisfactory offerings, and shown in fine blocks, stripes and mottled effects for coatings and suitings, are also at their best in the shell shades."

For the short separate jacket and the top-coat for mid-summer, Mr. Ryan submits a supple white cloth in the fleeced series, for which he anticipates an exceptional success. He has made models from over 60 differ- also shares the views of the domestic field in predicting the vogue of plain and printed flannels as the leading popular demand of the year, plaid and checked flannel in all probability proving the outstanding special feature.

Return of Alpaca

On the point of the importance of alpaca in the spring and summer showings Mr. Ryan was equally explicit in stating that, in his belief, white alpaca would prove itself in exclusive trade the parallel of white flannel in the popular series. In the choice of colors which would in all probability prove to be leaders in alpaca, amber, royal blue and green were cited.

Analyzing the conditions which have greatly aided in the development of the new sports mode in both London and Paris, Mr. Ryan offered the statement that the understanding which had been reached between France and England on this basis was due to a yielding on both sides in the desire for mutual benefits. France has abandoned the frivolous for the more substantial fabrics and styles, while England has tried in every possible way to abandon the utility sports idea for a more feminine appeal in the designing; the result is something new and satisfying to both French and English style critics.

Concerning this newer trend in English sports cloths, it is interesting to discover that the leading fabric designers have gone back to nature for color inspiration, utilizing the butterfly, the sand dune's lights and of colors. Thus is revealed, in Mr. Ryan's opinion, a far-reaching movement which will ultimately benefit the American sports market.

American Coatings and Suitings

With the opening of the Palm Beach season what is now very generally regarded as the "annual spring tryout" takes place. In the American fabric groups, it became early apparent that the various American mills had submitted an unprecedented array of stripes, with a strong development in plaids well under way, the blocks holding their own after a winter's popularity.

With the advent of the stripe of extreme width in the fall collections, as a second season's exploitation, interest in the type waned. It served, however, to induce textural and color developments in great variety. These ranged from cluster stripes in vari-color to the narrow lofted stripe in self tone. With the increased interest in camel's hair and cashmere productions, the high relief stripe has gained rapid headway and, in its mid-summer presentation for 1924 introduces a semi-sports coat of decided interest in white and pastel colors.

In relation to the recent extraordinary developments in the handling of the extreme patterns in decorative coatings, it is interesting to find that much of the inspiration which has entered into the interpretation of these extreme features for spring traces back to the convictions of A. Mayer, known to the cutting-up trade as "Mayer Chic." Mr. Mayer

ently styled novelties, with a peculiar insight into the possibilities of each fabric on the "self-fabric trim" principle. Every known type of nubbed, clipped, bouclé, brushed, fleeced and jacquard novelty has been submitted to him for interpretation. The development of rectangular insets from the stripe has resulted in the creation of borders, panels and reverse sections in the form of oblongs, squares, diamonds and domino blocks in working up boldly defined stripes.

These successful experiments have led to much discussion of the problem of so-called "difficult" patterns. It is possible that many unlike or contradictory styles may be given over to the designer of garments for development, but without explanation of the contrary currents of the market.

Mill Designer Cooperation

It is Mr. Mayer's conviction that all of the "mistakes" or "miscalculations" as to the trend of the fabric market, the sources of all failures properly to gauge timely design or consumer expectation, are due to the lack of established contact between the designer of the fabric at the mill and the designer of the garment. "Here is where all the uncertainty lies," said Mr. Mayer when discussing certain phases of this question recently. "How could any uncertainty exist if the mill man was aware of the ultimate fashioning of his cloth? Why should he, of all people, be working on the supposition that the coat, suit or dress designers "may" find the right way to make up his goods? Dozens of valuable designs come into a market which is moving firmly in the exactly opposite direction. They must either be withdrawn or sacrificed for the basement sale. The great benefits reaped in Europe by the direct relation established between the designer of the fabric and the designer of the garments to be evolved from it, are apparent to every designer in America today. But organization methods place the merchandise buyer as the obstructive element which defeats the whole purpose of reduction of costs for which his position was created. If any one doubts this, let them list the hundreds of bolts of rejected fabric which decorate the upper shelves of seven out of ten coat and suit houses. Direct contact between the designer of the fabric and of the garment is the essential factor in real cost reduction work in firms of all grades of production."

Position of Cashmeres

Cashmere cloths of the highest grade are said to be uncommonly successful in the piece goods departments, in striped versions in self-tone coatings and in neutral shades in suitings, where two or more carefully blended colors are related. As the rich depth of this cloth gains in favor, it has been considered as one worthy successor of the pile fabrics, which, in spite of much "commonsense" assertion to the contrary, are receding from consumer favor, suffering eclipse through overproduction and cheap imitation. The advice of those who study the consumer interests closely, induces belief that no sensational successor to these specialties will appear, but that all coatings of velour type, napped, fleece-face and other smooth textures will re-appear in plain and novel versions and thus successfully inaugurate unbroken developments along familiar lines in the de luxe class. In the practical coatings, shaggy effects, nubbed patterns and fleeces will lead. In the tweed group the compressed nub in both plain tone and mixed colorings has been too successful in the past season to relinquish and, in line with the expansion of all "novelty" homespun lines, will re-appear in both plaids and stripes. In the list of high priced features, coatings and suitings which present the appearance of tweeds, but with a camel's hair finish, are somewhat of a departure. In view of the general expectation of a return to the popular priced tweeds in checks, plaids, one and two-tone effects, the homespun revival would appear to mark a definite 1924-25 trend.

Dress Fabrics

In the list of both foreign and domestic dress fabrics reps and twills again divide honors. Alpaca boldly asserts its style supremacy in colors, but, in the French Couture in white, it is ranged up against white reps, broadcloth and flannel, all being developed in the suits, coat-dress and the new "two-piece dresses" which resemble nothing so much as a school girl's skirt and middy blouse made of matching material, or a combining of silk and wool fabrics.

Corded effects, flat and in relief, are seen in both imported and domestic collections of suits, dresses and separate skirts. Coverts are making re-appearance not only in the new "boyish suits," but in the cape-dress they are finding many sponsors. Tans, cocoa, olive-drab and several grays are seen most frequently, with almond green and brick preferred for the high-class productions.

Wool crepes in all weights, and in both plain and novel renditions, are found to be in a strong position, with a considerable interest maintained in numbers showing artificial silk decoration.

Kasha, kasha-flannel and numerous cashmere developments retain their prestige, notably in white and bright shades.

Matelasse novelties are shown in foreign Couture collections in white, black and navy, usually in combination with a plain fabric. Eponge is favorably regarded in sports wear and a variety of drawn work stripes and cross-bars may be found in woolen, silk and cotton fabrics. At the beginning and the end of the 1924 fabric list, flannels, plain and novel, must be heavily underscored as having the greatest development for dresses, coats, suits and skirts in many, many years, while blazer flannels find themselves again approved as high fasion.

Forward Movement in Silks

An immense diversity in prints, a broadly inclusive development in plain cloths and the dominant influence of silk and silk and wool alpaca marks the representative silk showings of the new season. Unquestionably, the most discussed feature is the position of artificial silk in the alpaca series. Special successes recorded in the list of American alpacas are Cheney's Drapaca and Delpaca, Mallinson's All-Silk Alpaca, Golding's Alpaca Moire, and a novelty alpaca, an all-silk number showing stripes and plaids issued in January by J. A. Migel. The sensational success of Fulgurante, the fibre satin submitted by Bianchini-Ferrier, in 1921, served to stimulate interest in the possibilities of artificial silk and a steady stream of successful experiments have followed, none more appreciated than the supple and adaptable alpaca rendition. In white, bright shades and with an admixture of metal, it is equally successful. A number of fibre satins have appeared which introduced pure silk, and in certain instances a successful double-face satin crepe has been advanced. The current demand for dull-lustrous reversibles is however, an indication that the two-face satins may make headway slowly.

In the main, the dull black crepes have been less in evidence for spring and summer, one such movement alone indicating a forward tendency —namely, the crepe Roma type which is augmented by the appearance of a new number, a super-fine semi-transparent feature. Where the dull black is accepted, however, it is largely modified by combination with white or red, usually handled so that the color values are evenly distributed, a handling differing altogether from the effect of black trimmed with color.

Moire holds a tenacious place, but is most successful in its satin reversible expression. Moire crepe-faille is another good version.

Lustrous crepe de chines are especially approved in a new heavy weight, and, in the printed novelties, include a new series of sports "shirting" patterns in stripes. These novelties are for practical use, tub perfectly and include many varied treatments in multi-color on white and pastel grounds.

Plain corded silks show the bengaline influence and ottomans, which have enjoyed a successful revival in Paris in the making of coats, suits and wraps, are found in American collections. Concerning these, however, reports indicate that the faille crepes will in all probability reap the benefits of a definitely ribbed influence this season. Cantons and the wool-filled specialties are not only holding their own in the plain, but also in the printed cloth.

Highly Diversified Prints

From the standpoint of comparison with the leading design trends of recent seasons, the first impression of spring and summer silk prints is that close spacing of small motifs leads in the popular groups. The influence of Oriental tradition is strong and it will be found that archaic motifs, in general, have been carefully adhered to where Persian, Chinese, Japanese and other Asiatic derivations are discernible. A free transcription of East Indian prints has been followed by one leading silk house with all-over movements broken by "travers" or crosswise stripings. In the use of the sections thus indicated, it suggests scarfs, panels, cape sections and a great variety of uses. The small Persian rose moves through many of the Far Eastern small scroll patterns in the manner of the hand-block cottons. A most striking mitred stripe, or the diagonal line, introduces a widely varied floral and geometric handling, the stripes modified rather than offering boldly executed patterns.

Chinese motifs and colors are well conceived, as are those of Indo-China and Siamese influence which, however, carefully avoid the bizarre, revealing a more artistic adaptation than heretofore submitted in the popular-price lines. Where the angular movements prevail, they offer great diversity of styling and range from closely filled squares without back ground spacing, one inch in size, to a four and five inch square set at wide intervals upon white, light, dark and intermediate grounds. In the latter group, primitive designs are effected by lines executed in two, three and four colors and have a fresh and individual appeal.

Domino blocks, cubes and a great variety of angular dots are found in the practical "calico prints," which, as they re-appear each year to a guaranteed success depend upon their color treatment for the look of newness. A series listed in the "unit" patterns introduces groups of black inch blocks on white or pastel grounds, with considerable effect.

Polka Dots Revived

After a protracted disuse, the polka dot makes a successful reappearance. The new spacings and border effects allotted them, however, bring them well within the fashion range. The traditional spotting is adopted, but there are also octagons, ovals, fountain-spray drops and comet-tail flecks which, added to the ever-popular confetti and star-drift patterns, round out a most popular series. Black and white, white and navy, are also leaders in the early showings of these patterns, with navy, red and white the success of the calico prints. Almond green, navy and white is another early success.

The Menace of U.S. Ten-Million Bale Crops

This Appears to Be a Fair Average of Expectancy for the American Yield Under Boll Weevil Conditions, and the Question Is, What Are We Going to Do About It? The Answer Is, Curtail Consumption, and This Seems to Be Up to England and the United States

By *John A. Todd* *
(Author of "The World's Cotton Crops")

FOR the third year in succession the cotton world is faced with the prospect of an American cotton crop which cannot substantially exceed ten million bales, excluding linters. During the past two seasons we have been able to put off the evil day of reckoning, because, owing to abnormal conditions of demand, an enormous carryover had been accumulated during the seasons 1920-21 which made it possible to carry on for a time by living on our capital. But by the end of last season the world's stocks had been reduced to a figure well below the pre-war normal, so that now we can no longer evade the problem; this season's consumption must not exceed the year's production, or the available stocks will be reduced before summer to a point so low that panic would be almost inevitable.

In these circumstances the first question naturally is whether this situation is likely to be permanent, or whether these three bad crops have somehow been due to a run of ill luck which may be expected to turn. That raises the question of the cause of the crop failures, and of that there can now be no practical doubt. It is the result of a combination of adverse circumstances, of which the most important were the boll weevil and the weather; and it is now clear that the former of these is under present conditions likely to be as permanent as the latter. But we have also to keep in view that the two evils are in a way complementary to each other, because the weather that will keep the boll weevil in check is sometimes bad for the crop. Heavy frost early in the winter reduces the chances of survival of the weevil, but unfortunately such killing frosts are less usual in the Atlantic States, where also the cover in winter is much better, so that in that part of the Belt we cannot hope for very much assistance from the weather in winter. Again in the West great heat in summer kills enormous numbers of the weevil; but to have that effect it must be so intense and so prolonged that it is almost certain to result in a drought, which will do the crop more harm than the boll-weevil itself. In the Atlantic States on the other hand such extreme heat is very unusual, at least within reach of the seaboard, so that again we have to admit that the weather is not likely to help very much in that area. The position therefore may be put in this way. In the Western States there is always a fighting chance against the weevil if the weather is favourable, but in the Eastern States the cotton grower cannot expect very much help from the weather.

Hope Lies in the West

Again the value of that fighting chance in the West has been greatly enhanced by the new high level of cotton prices. At 30c. or more it should be worth while to take a chance on cotton, for if Texas makes a crop (as it did this year) it will be a very profitable crop, if other parts of the Belt are more or less a failure. And that chance may be still further improved if the planters take full advantage of the aids which modern science offers in the way of fertilizers, and also of good cultivation. Until recent years Texas made very little use of fertilizers, because the chance of getting their money back out of a moderate crop at a low price was not worth the risk of a poor yield owing to bad weather.

John A. Todd, the author of this article, is an economic authority on the world cotton situation, and his opinion on the existing cotton scarcity and its possible results and remedies is worthy of careful study.

In his opinion an American crop of more than 10,000,000 to 12,000,000 bales is not to be expected during the next few years. His conclusions after valuating the possibilities of increased production in other parts of the world and the possible restriction of consumption, is that England might curtail to the extent of possibly half a million bales, and the rest of the world, outside of the United States, about half a million more. This, however, still leaves 1,000,000 bales, or 14 per cent, to come off of United States consumption of last season, if there is to be a comfortable carry-over at the close of each season and if a further radical advance in prices is to be forestalled.

But now the whole position is changed by the probability of a high price, which makes even the possibility of a good crop at such prices very tempting indeed, and well worth risking heavier expenditure on the crop.

We must not therefore exaggerate the blackness of the outlook; it is still possible that, given ordinary luck in the weather, part of the Belt at least might give quite a fair crop. South Carolina has done so this year, as well as Texas, in spite of boll-weevil, and in future we shall be thankful for small mercies. It is not necessary therefore to assume that we shall never again see an average yield of as much as 150 lbs. per acre over the whole Belt. With good luck we might do as well as that, and given a still further increase of acreage, say forty million acres planted and perhaps 38 millions picked, we might get a crop of about 12 million bales again. But that faint hope must not be allowed to make us forget the stern fact that the probabilities are all against our doing so often. The best guess for the immediate future is an average of under rather than over 11 millions. (These figures are excluding linters, which normally add about half a million bales to the total).

Must Cut Coat to Fit Crop

To bring home to everyone concerned what that means to the world only one set of figures need be cited. Before the war the world was consuming at least 14 million bales of American cotton per annum, excluding linters. Since the war we have come very near 13 million bales in every season but 1920-21 when, owing to artificial conditions of demand, (the result of the adoption of a definite policy of deflation and restriction of credit) the world consumption was reduced to about 10 million bales. Today there is no doubt that even with so many countries in an abnormally bad position as regards power to purchase the goods of which they are in desperate need, the world could very easily use a crop of 13 million bales, if it could get it at anything like a reasonable price. They will certainly not get it this year, and the chance of getting it in future years is very slight. Clearly therefore we must cut our coat according to our cloth. The world must make up its mind to do with a great deal less American cotton than it would like, and the next question is "How are we going to do it?"

There are obviously three alternatives. (1) We can use other kinds of cotton in place of American, and if the present supply of these is not sufficient we can grow more. (2) We might make better use of the cotton we have, and this is partly just the first alternative in another form, for it means not only getting the best possible results out of every pound of raw cotton by eliminating waste, but also by using in every case the lowest grade of cotton that can possibly be made to serve any particular purpose. (3) We might find substitutes for cotton e. g., by reversing the process of substitution which had been developing so rapidly before the war, under which cotton was rapidly pushing its way into the wool, linen and silk trades, not merely as an adulterant but as a really effective substitute; or again we might find some "synthetic" substitute such as artificial silk. These alternatives must be examined a little more closely.

(1) Other Growths

The use of outside growths has already been pushed much further than anyone would have anticipated a few years ago, yet there is no doubt that Indian cotton at the one end, and Egyptian at the other, could be substituted for American to a much larger extent than has even yet been done; but unfortunately the difficulty is that the supply of all these outside growths is really very limited. It will be seen from Table I of the World's Crops attached that the American crop is still 50% of the world's total, and the loss on the American crop since 1914, say 6 million bales, has been accompanied by a net decrease of about a million bales in all the rest of the world. It is true that some of these outside growths have increased substantially since 1914, but unfortunately others, including some of the largest e. g., the Russian, have diminished to such an extent as more than to wipe out the whole increase of the others. Of course the new high level of prices will provide a strong incentive to all the world to grow more cotton, and there is no doubt that in course of time these other countries will make up the loss on the American crop, but the thing cannot be rushed. Cotton growing demands an elaborate organization which requires time, money and patient spade work, and the pace simply cannot be forced except by making it more worth while to the grower. The world war put things back very seriously not merely because of the inevitable disturbances of all kinds that it created directly, but by the terrible fall of prices which marked the winter of 1914-15; and the still greater slump of 1920-21 did even more harm by destroying the reviving confidence of the would-be cotton grower in the possibility of really remunerative prices. The writer would here hazard a suggestion (which he knows will not be listened to for a moment) that if the

*Principal of the Liverpool (Eng.) School of Commerce.

cotton world really wants a big increase of the cotton supply quickly they could get it by guaranteeing a minimum price of 30c. for the next ten years. Failing that, let the world remember that every time the price of cotton drops heavily, say 30% below what has come to be regarded as the new normal price, the prospects of cotton growing in new areas suffer a set back which will not be recovered till long after prices have risen again. Until the world realizes this, cotton growing pioneers must still struggle along with the heart breaking task of getting people to grow a crop which may pay them or not, as the incomprehensible vagaries of distant and unknown markets may dictate. In the meantime we must face the fact that there is no immediate prospect (except possibly in Russia and Brazil) of increasing the supplies of outside growths to the extent of even a million bales per annum.

Further it must be remembered that the attraction of substituting other cottons for American is very largely a question of price, as for example the increased use of Egyptian cotton by spinners of American during the latter part of the past season, because relatively Egyptian at that time was preposterously cheap. But that very quickly defeats itself, for the total supply of these other varieties is comparatively small, and a relatively small transfer of the American demand to Indian, or still more to Egyptian, means a large increase of the demand in that smaller market, and very quickly pushes up the price to such an extent that the inducement to substitute disappears.

(2) Better Use of Available Cotton

The conclusion therefore is that we cannot hope for very much relief from substitution of other growths, but there still remains the suggestion that something might be done by eliminating waste. There is a good deal of evidence to the effect that not all the world's spinners are so fully alive as they might be to the possibilities of getting better results out of their cotton than they do, or rather of getting the results they want out of a lower grade of cotton than they are using at present. Germany and Belgium showed us before the war what could be done with Indian cotton; and there is nothing the writer is more proud of than the fact that in 1919, when the acute scarcity of Egyptian cotton was still in the future, though obviously coming, he warned the tire makers of the United States that they must stop using so much Egyptian cotton or they would create a veritable famine. Poverty makes strange bedfellows, and perhaps there are still spinners (and manufacturers too) who will be compelled by force of circumstances to try grades of cotton, the very suggestion of which a few years ago would have been met with scorn. Lancashire for instance has never quite escaped from the tradition of "Surats" in the cotton famine of the sixties.

Then there are possibilities of elimination or utilization of waste which in the old days was not worth bothering about, but which may now prove worth while. Perhaps even those who are responsible for the handling, and particularly the baling, of the American cotton crop, may be brought to realize that the wasteful methods which have in the past been directly and indirectly responsible for untold losses of American cotton, and which were perhaps excusable with cotton at 10c., are now a very different matter with cotton at 30c., and can no longer be tolerated.

TABLE I — THE WORLD'S COTTON CROPS, 1902–1923

Bales of 500 lbs. (approx.), 000's Omitted. Linters Included in American Crop

YEARS	America	Per cent of world's total	India[1]	Egypt	Russia	China	Others	Total	Per cent of 1913
1902-03	10,784	61	3,367	1,168	342	1,200	891	17,662	
1903-04	10,016	59	3,161	1,302	477	1,200	751	16,907	
1904-05	13,697	66	3,791	1,263	536	756	803	20,816	
1905-06	10,726	61	3,416	1,192	604	788	938	17,664	
1906-07	13,305	60	4,934	1,390	759	806	1,027	22,221	
1907-08	11,326	62	3,122	1,447	664	875	950	18,384	
1908-09	13,432	61	3,692	1,150	698	1,933	971	21,876	
1909-10	10,385	51	4,718	1,000	685	2,531	950	20,270	
1910-11	11,966	53	3,889	1,515	895	3,467	968	22,700	
1911-12	16,109	61	3,262	1,485	875	3,437	1,058	26,226	
1912-13	14,091	58	4,421	1,507	870	2,360	1,160	24,409	
1913-14	14,614	57	5,066	1,537	969	1,963	1,273	25,422	
Pre-war averages	.....	59	.....	.....	.....	.....	.....	.....	77
1914-15	16,738	60	5,209	1,298	1,152	2,332	1,142	27,871	100
1915-16	12,013	56	3,738	961	1,413	2,068	974	21,167	76
1916-17	12,664	58	4,489	1,022	1,085	1,569	1,027	21,856	78
1917-18	12,345	59	4,000	1,262	605	1,583	1,079	20,874	75
1918-19	12,817	61	3,972	964	334	1,725	1,293	21,105	76
1919-20	11,921	53	5,796	1,114	302	1,690	1,487	22,310	80
1920-21	13,711	64	3,600	1,206[4]	120	1,351	1,423	21,411	77
1921-22	8,378	50	4,479	972[4]	78	1,340	1,530	16,777	60
1922-23	10,438	50	5,196	1,243[4]	137	1,955	1,739	20,708	74
1923-24	10,681[3]	51	*5,000*[2]	*1,200*[2]	*150*[2]	*2,000*[2]	*1,850*[2]	*20,881*	75
Post-war averages	.....	56	.....	.....	.....	.....	.....	.....	75

[1] 400 lb. bales.
[2] Estimates (in *italics*).
[3] 12 Dec. estimate, adding 600,000 bales for linters.
[4] Made up as follows:

	Actual arrivals — kantars 000's	Estimated up-country carryover	Estimated crop
1920–21	5,030	1,000	6,030
1921–22	5,358	500	4,858
1922–23	6,713	.....	6,213

(3) Artificial Fibres

There remains the question of substitution of artificial fibres, in which direction there are undoubtedly great possibilities. Of these artificial silk is the best known and most striking, though we may also recall the use of paper yarns in Germany during the war. Unfortunately, however, the total world's production of artificial silk is still comparatively small. Even allowing for the most rapid increase possible it will be a long time before artificial silk will make up for the loss on the world's cotton supplies; and of course there will always be many purposes for which artificial silk would not be suitable.

It appears therefore that there is no easy way of escape from our difficulty. The world's supply of American cotton is going to be seriously short of the potential demand for some years to come, and in one way or another restriction of consumption will have to be enforced. That inevitably raises the further question—"Who is to do the restricting?" which again divides itself into two questions. In the first place there are many different classes of users of cotton throughout the world, e. g., taking its use in clothing alone, there are the tropical countries, where cotton is the main part of the clothing supply, because wool would be intolerable, while in other parts of the world where the climate is colder, cotton is only a relatively small part of the supply and can easily be replaced by wool or sometimes linen, if silk is too expensive.

Again cotton is used for an infinity of other purposes of which perhaps the most important single use nowadays is in the motor industry. In the second place, almost every country in the world now does more or less cotton manufacturing within its own borders. The mill industries of the world are of course by far the largest users, but in tropical countries there is also a large domestic consumption in the strict sense of the term i. e. consumption by hand-spinning in the actual homes of the people. The difficulty is that while it is possible to get fairly reliable statistical data regarding the mill industry, it is impossible to get any statistics of the domestic consumption.

Table II attached gives the latest particulars available of the mill industries of the world, founded on the statistics compiled by the Interna-

TABLE II — WORLD'S COTTON SPINDLEAGE, 1913, 1920 AND 1923

COUNTRY	31st August, 1913				31st July, 1920				31st July, 1923			
	Spindles			Consumption per 1,000	Spindles			Consumption per 1,000	Spindles			Consumption per 1,000
	Total active	Per cent mule	Per cent ring		Total active	Per cent mule	Per cent ring		Total active	Per cent mule	Per cent ring	
	000's				000's				000's			
Great Britain	55,653	81	19	77	58,692	79	21	64	56,583	78	22	49
Per cent of world's total	39	.....	.....	.....	40	.....	.....	.....	36	.....	.....	.....
France	7,460	54	46	137	9,400	47	53	111	9,600	44	56	126
Germany	11,186	46	54	158	9,400	48	52	93	9,382	46	54	108
Russia	9,213	41	59	272	No statistics				7,246	40	60	271
Poland	Included under				1,400	23	77	65	1,200	39	61	190
Finland	Russia				240	28	72	109	241	26	74	134
Italy	4,600	25	75	172	4,515	25	75	171	4,570	18	82	196
Austria	4,909	51	49	171	No statistics				1,023	51	49	107
Czecho Slovakia	Included under Austria				3,584	56	44	61	3,508	52	48	71
Spain	2,000	40	60	179	1,800	39	61	217	1,813	34	66	194
Belgium	1,492	33	67	172	1,573	29	71	160	1,683	28	72	162
Switzerland	1,398	82	18	70	1,536	59	41	58	1,513	56	44	49
Sweden	534	27	73	216	670	23	77	175	566	18	82	148
Holland	479	41	59	177	598	33	67	182	669	32	68	166
Portugal	480	27	73	164	482	17	83	140	487	34	66	177
Denmark	90	16	84	285	117	9	91	255	97	13	87	296
Norway	75	28	72	154	73	21	79	171	66	20	80	114
Total continent	43,856	.....	.....	.....	35,388	.....	.....	.....	43,664	.....	.....	.....
Per cent of world's total	30	.....	.....	.....	24	.....	.....	.....	28	.....	.....	.....
India	6,084	28	72	358	6,690	19	81	319	7,331	16	84	307
China	Included under sundries				1,600	.....	100	?	2,680	.....	100	600
Japan	2,300	2	98	691	3,690	2	98	660	4,877	1	99	535
Total Asia	8,384	.....	.....	.....	11,980	.....	.....	.....	14,888	.....	.....	.....
Per cent of world's total	6	.....	.....	.....	8	.....	.....	.....	9	.....	.....	.....
United States of America	31,505	13	87	184	35,872	9	91	181	37,397	6	96	194
Per cent of world's total	22	.....	.....	.....	25	.....	.....	.....	24	.....	.....	.....
Canada	855	45	55	133	1,200	31	69	174	1,076	43	57	164
Mexico	700	.....	.....	227	720	4	96	175	770	1	99	177
Brazil	1,200	.....	.....	424	1,600	.....	100	228	1,700	.....	100	396
Sundries	1,300	.....	.....	?	250	.....	100	?	275	.....	100	312
Grand total	143,453	49.5	50.5	156	145,701	44.5	55.5	146	156,353	42	58	145

tional Cotton Federation and those of the U. S. A., Census Bureau. From this table the distribution of the world's cotton spindles among the various countries can be easily seen. The largest shares of the world's spindleage are of course in Great Britain and the United States; which now include 36% and 24% respectively of the world's total, but the Continent of Europe shows a total of 28% and India, China and Japan are also large enough to be important, with 9% of the total.

But again, differentiation is required as to the kind of goods produced in these various mills and the quantity of cotton they consume. This is very clearly brought out by one figure, namely the quantity of cotton consumed per thousand spindles in each country. It will be seen from Table II that in 1913 this figure varied from 70 in the case of Switzerland and 77 for England to 184 in the U. S. A., and 691 for Japan. The corresponding figures for 1923 are affected by short time working but the comparisons are not much different. It is interesting to note how closely these figures correspond with the percentages of mule and ring spindles which are also shown in the table.

Who Are to Do the Curtailing?

The question then comes to be: (a) which classes of the world's users of cotton fabrics are to be compelled to restrict their consumption and (b) which of the cotton manufacturing countries of the world are to reduce their share in the supplying of these modified needs? The answer to these questions obviously lies in two other questions:

(1) The power of a particular class of consumers to buy cotton goods is obviously involved in the general question of their purchasing power as a whole. The more poverty stricken countries, and those in which financial conditions are confused by problems of foreign exchange, etc., will obviously find greater difficulty in buying goods at high prices; while on the other hand the great bulk of the consuming public in a country like America, where industry is booming again and wages are high, are obviously in a position to buy freely without much thought of the price, for after all a very substantial increase in the price of the raw material may not make much difference in the prices of the finished goods, especially in the case of the finer goods. (2) Again, the probable redistribution of the shares which each manufacturing country is likely to retain in the world's production of cotton goods depends to a large extent on their power to adapt their cost of production to the changed circumstances of the time. If, owing to low wages on the one hand, or increased efficiency on the other, one country can manage to go on selling goods at an increased cost less than the equivalent of the increased price of the raw material, they may be able to hold their share of the world's trade better than another country where the whole increased cost is passed on to the consumers in the price of the finished goods.

India as a Cotton Consumer

Keeping these points in view, let us then attempt a rapid survey of the world both as consumers and producers of cotton goods. Taking consumption first, the heaviest consumers of cotton goods are tropical countries such as India, China, Central and South America. Now what is the position of these countries today as regards purchasing power? In India everything depends on (a) the crops, which depend on the Monsoon, and (b) the rupee exchange which depends on the price of silver. On both these points India's position today is a great deal better than it was a year or two ago; and again it must be remembered that India's power to purchase cotton goods actually depends to a considerable extent on the price of cotton, of which she is herself a large producer, as well as of many other raw materials.

Probably therefore, the conclusion with regard to India is that her consumption of cotton as a whole is not likely to be reduced very greatly, but that she has greater possibilities for replacing her consumption of American cotton by other varieties than perhaps almost any other country. Note for example in Table III (a) how India's mill consumption of American cotton fell to almost nothing in 1919-20.

China Ranks Ahead of India

As a consumer of cotton goods China probably ranks even ahead of India, for not only does she import heavily from England, Japan and America, but she also has a growing mill industry of her own now possessing nearly three million spindles (see Table II). But in addition to this China unquestionably uses more cotton for domestic consumption than any other country in the world, and that in a peculiar way, namely in the form of wadded garments, which take up an enormous quantity of cotton. There is unfortunately no possibility of getting reliable figures on this point, because the total of the Chinese crop is practically unascertainable. It is sometimes put as high as 4 or 5 millions, but of this all that

TABLE III—WORLD'S CONSUMPTION OF COTTON BY COUNTRIES AND VARIETIES

	1912-13	1919-20	1920-21	1921-22	1922-23
(a) AMERICAN					
Great Britain	3,667	2,891	1,678	2,275	1,919
Per cent on 1913	.....	79	46	62	53
France	806	671	644	799	790
Germany	1,355	382	683	911	740
Russia	487	.....	.....	27	122
Poland (included under Russia)	.....	35	96	170	167
Finland (included under Russia)	.....	26	29	33	32
Italy	571	549	562	573	601
Czecho Slovakia (included under Austria)	.....	86	208	309	178
Austria	627	.....	54	85	61
Spain	285	305	224	294	249
Belgium	171	159	113	136	129
Switzerland	65	57	55	55	57
Other continent	272	272	235	222	238
Total continent	4,639	2,542	2,803	3,615	3,364
Per cent on 1913	.....	55	60	78	74
United States	5,553	6,352	5,188	6,254	6,961
Per cent on 1913	.....	114	93	112	125
(Linters included)	303	342	516	639	638
Canada	113	118	147	156	175
Mexico	.....	.....	41	50	20
India	94	0.5	27	54	26
Japan	425	709	622	796	723
China	.....	.....	35	181	110
Others	16	.....	3	10	6
Grand total	14,507	12,612	10,544	13,391	13,304
Per cent on 1913	.....	87	73	93	92
(b) INDIAN					
Great Britain	54	56	39	54	107
Per cent on 1913	.....	104	72	100	200
France	95	57	69	119	170
Germany	188	79	205	219	213
Russia	21	.....	.....	.....	.....
Poland (included under Russia)	.....	12	19	37	44
Finland (included under Russia)	.....	.....	.....	.....	.....
Italy	175	147	208	200	239
Czecho Slovakia (included under Austria)	.....	8	43	50	61
Austria	154	.....	37	25	41
Spain	34	40	59	46	65
Belgium	82	73	94	100	127
Switzerland	3	6	7	6	7
Other continent	17	21	13	26	30
Total continent	769	446	770	828	997
Per cent on 1913	.....	58	100	108	130
United States	.....	12	11	11	21
Per cent on 1913	.....	.....	.....	.....	.....
India	2,081	2,032	2,188	2,207	2,197
Japan	993	1,150	1,416	1,483	1,722
China	.....	.....	145	346	357
Other	.....	.....	2	.....	1
Grand total	3,897	3,696	4,571	4,926	5,402
Per cent on 1913	.....	95	117	126	139

	1912-13	1919-20	1920-21	1921-22	1922-23
(c) EGYPTIAN					
Great Britain	392	429	237	336	393
Per cent on 1913	.....	109	60	85	100
France	80	70	42	74	93
Germany	110	16	24	41	39
Russia	87	.....	3	7	2
Poland (included under Russia)	.....	.....	5	4	7
Finland (included under Russia)	.....	.....	.....	.....	.....
Italy	19	36	20	22	44
Czecho Slovakia (included under Austria)	.....	1	6	9	8
Austria	33	.....	2	2	3
Spain	20	25	11	19	33
Belgium	1	2	2	4	4
Switzerland	29	20	20	26	30
Other continent	1	.....	.....	2	5
Total continent	380	170	135	210	268
Per cent on 1913	.....	45	36	55	70
United States	134	243	110	156	180
Per cent on 1913	.....	182	82	116	134
India	1	4	6	10	5
Japan	16	21	16	26	31
Others	14	.....	57	10	21
Grand total	937	867	561	748	838
Per cent on 1913	.....	93	60	80	96
(d) SUNDRIES					
Great Britain	161	137	70	199	351
Per cent on 1913	.....	85	43	124	218
France	29	24	31	43	126
Germany	47	44	25	21	22
Russia	1,913	.....	923	595	385
Poland (included under Russia)	.....	.....	13	9	10
Finland (included under Russia)	.....	.....	.....	.....	.....
Italy	25	8	5	5	9
Czecho Slovakia (included under Austria)	.....	3	3	6	7
Austria	23	.....	1	1	1
Spain	19	20	4	3	4
Belgium	3	1	2	3	12
Switzerland	1	1	.....	1	1
Other continent	24	15	33	30	39
Total continent	2,084	116	1,040	717	616
Per cent on 1913	.....	6	50	34	29
United States	32	160	67	114	98
Per cent on 1913	.....	500	209	356	300
Mexico	.....	125	79	82	116
Brazil	.....	401	522	477	670
India	1	10	23	43	24
Japan	155	204	68	70	100
China	.....	862	891	867	1,138
Others	1,091	92	23	167	64
Grand total	3,524	2,107	2,783	2,736	3,177
Per cent on 1913	.....	60	79	77	87

ever has come into commercial channels i. e., exports and mill consumption, has probably never touched two million bales. The remainder, whatever it amounts to, is used entirely in domestic consumption.

It is true that the great bulk of their demand is for cheap coarse goods, but not by any means all of it, and probably a very substantial part of Lancashire's exports of fine goods to the East are bought by comparatively wealthy consumers to whom the price is not a very serious question. It would be quite easy therefore to exaggerate the probable effect of the restricted purchasing power of the East on the probable consumption of cotton goods as a whole, but there may well be a fair reduction of their consumption of American cotton, either directly or in the form of imported goods.

European Consumption Evaluated

What has been said with regard to India and China may be taken as roughly typical of the position with regard to the whole of the Orient. We come next to deal with the position of Europe, which may be divided into three sections (1) those parts of Europe, especially Germany, Austria, and Russia, where the whole position of the countries concerned as would-be purchasers of cotton goods is about as bad as it could possibly be (2) those countries, including the neutrals of Europe, whose financial position on the whole has not suffered much as the result of the war and (3) others of the belligerent countries like Italy, France and Great Britain, who have their own difficulties as the result of the war, but are by no means bankrupt in the widest sense of the word.

Taking the first of these, especially Germany and Austria, the position is greatly complicated by the fact that these countries are not only large consumers of cotton goods, but also large producers in their own factories; and one of the causes which make their position difficult as would-be purchasers of raw cotton or foreign manufactured goods, puts them in a favourable position as manufacturers and exporters of cotton goods. The confusion of the exchanges inevitably cuts both ways. If Germany pays dearly for her imported raw materials, she gains heavily on the export of her cotton goods; and if she prefers to avoid the uncertainty of these gains and losses, she can do it to a large extent by leaving the price of the finished goods in the foreign country where they were sold, or transferring it to another country where she desires to buy raw materials.

When stabilization does come, and in whatever form it comes it must mean deflation and lower prices, the troubles of the German industry will only be beginning. England and America have not forgotten what deflation meant to them in 1920-21, and Germany will certainly have to go through something similar some day.

With regard to Russia the position is again complicated by the fact that Russia is a substantial producer of raw cotton, as well as the owner of quite a substantial spindleage in her own cotton mills. In Turkestan and Transcaucasia she had a supply of cotton which in 1914 exceeded a million bales, and which was probably the only crop in the world that increased considerably in the early years of the war. Russia had all along been trying to conserve the home supply of raw material for the benefit of the native industry; and when overseas supplies became almost impossible, she was able to fall back on the native supply to a very useful extent. Unfortunately, however, the breakdown of national organization which followed the revolution, resulted in the almost complete abandonment of Russia's cotton crop. But if the Russian industry is to revive, as it might do much more easily and more quickly than is commonly imagined, there is no reason why the recovery of her cotton growing industry should not keep pace fairly well with that of the cotton industry; and in that way Russia might be able to supply a fair proportion of her own needs, which of course are enormous with so huge a population. But to tell the truth, most people in trying to envisage prospective developments in the world's cotton consumption since the war, have found it desirable to assume that Russia will remain a negligible factor for some time to come, because they simply could not face the possibility of her doing anything else. The fact of the matter is that if Russia's consumption of cotton had within the last four years, or should within the next few years return to anything approaching normal figures, it would be the end of the world as regards the raw cotton situation. It is only because Russia has been out of it almost completely during recent years that we have been able to pull through at all. In our survey of the world, therefore, we may leave Russia out in considering the question of further restriction of consumption. The developments in the next few years are not likely to be in that direction.

Position of Neutrals

With regard to the neutrals in Europe the position is fairly simple. They have of course, suffered from the post-war financial dislocation which the exchanges have brought all over Europe, but on the whole they have not suffered very much from the war, at least compared with their belligerent neighbours and their direct consumption of American cotton has only been restricted to a very small extent (See Table IIIA). No doubt they have had to restrict their imports of manufactured goods like everyone else, but statistics of the extent of the reduction are not obtainable. If the price is to go still higher they will of course, have to restrict still further, but there is no reason to suppose that they will be any worse than their neighbours. So far as their imports are concerned they may practise some further economy, but as their own local cotton industries are entirely dependent on imported cotton, there is no reason why their home production of cotton goods should be either more or less affected than their imports of foreign goods. It may be noted, however, that Belgium has always specialised on the spinning of Indian cotton, and she might develop along that line to a further extent, which would enable her to reduce her mill consumption of American cotton more effectively than the others.

As to France and Italy they lie in a sort of mid-way position between the neutrals and Great Britain. As victors they are supposed to receive compensation for their war losses which, however, has not yet materialised, but they have to some extent equalised on this by not paying their war debts. Their cotton industries suffered very heavily during hostile occupation, but have made a wonderful recovery in that respect, and France of course has gained very largely by the acquisition of the Alsace Lorraine section of the German cotton industry. Italy neither lost much nor gained anything in spindles. But France and Italy have been more or less alike in refusing to face the problem of deflation, with the result that they have so far avoided the troubles which inevitably accompany that process, and their industries have flourished continuously. Much will depend on the final solution of the Reparations problem, but it is very doubtful whether France especially will ever get enough out of Germany to cover the accumulated deficits on her budgets during recent years and enable her to get rid of the burden of paper money which has been the only means by which she could finance herself in recent years. In that respect, therefore, her troubles are, like Germany's, still to come.

England's Problem

We come than to the case of Great Britain which is peculiar in many ways. In the first place she still has the largest spindleage of any single country in the world, and also the most varied production of cotton goods of all kinds, including almost a monopoly of the very finest, and a distinct advantage further down the scale. Her home population is large, say about half that of the United States, and they are large consumers of cotton goods, but unfortunately we have no statistics at all of the home trade except the one Census of Production taken in 1907. From that it appeared that about 90% of her total production was finally exported either as yarns or finished goods; probably the percentage is not very much less today. This makes her position peculiarly liable to be affected by any change in conditions abroad, such as the post-war chaos of the exchanges, which affects a large part of her customers. Thus the problem of England's cotton industry is really the question of the purchasing power not only of Europe, but also of India and China, and to a considerable extent of all the rest of the world.

Recalling then all that has been said about these countries the question is what will be the effect on England's trade. For it must be remembered that what we have to consider is not merely the direct effect on her export trade, but also the indirect effect on her home trade, because bad times for England's foreign customers mean bad trade for every class of producers in England, and therefore depression of the home section of the cotton trade as well as the export. All this was brought out with painful clearness during the period of the deflation slump in 1920-21, when almost every section of England's industries received a staggering blow, from which they have not yet completely recovered. In order, however, to get a more exact impression of the effect of all this on England's trade, it is necessary to go more fully into the actual statistics of consumption and these will be found in Table III. From this it will be seen that while England's consumption of American cotton in 1922-23 was down to 53% of pre-war figures (largely as the result of severe short time, especially in the latter half of the season) her consumption of other varieties was as follows: Indian, 200%; Egyptian, 100%, and Sundries, 218% of pre-war figures. Apparently there is some life in the old horse yet; and with all her disadvantages of high taxation, high wages, shorter hours and high cost of raw materials, England is still able to put up a pretty good show in competition with other producers of cotton goods. Nor has England begun yet to import manufactured cotton goods from other countries to any great extent!

Moving still further westwards to the American continent we have again to note a general division of the area. In the United States and Canada we have roughly one set of conditions which is unique, while in the other countries especially those of Central and South America, we have entirely different conditions which are something of a cross between those of India and China on the one hand, and those of the neutral European countries on the other. Unfortunately we have hardly any statistics at all for these Latin American countries. It is, however, the conditions prevailing in the United States with which we are most interested to deal.

U. S. Problem Largely Domestic

What makes the position of the United States different from all the others is generally supposed to be the fact that she has an enormous and more or less self contained home market, which is comparatively independent of conditions in the old world, and which has therefore to a large extent escaped the effects of the financial chaos in Europe. By adopting at the same time as Great Britain

the heroic policy of deflation, she wrote off very quickly the after effects of the war on her internal affairs, and having put her own house in order she was able to go ahead promptly on an ascending spiral of improving trade, because having no very great trade with the distressed countries of the old world, she was not greatly affected by their failure to get going again at once. In this she had a great advantage over England, who wrote off her own war losses even more drastically than America, but has been hampered in the subsequent recovery by the inability of other countries who are important customers, to do the same. The result has been that the large population of America has enjoyed the benefits of a comparative post-deflation boom, and the rising wages which naturally resulted have been enhanced by the scarcity of labor due to the policy of restricted immigration. The purchasing power therefore, of the bulk of her population has been probably greater than ever, with the result that they were able to buy all they wanted of cotton goods among other things, and the rise of prices of these goods did not seriously affect them. For here again is another point that must be remembered. The rise in the price of raw cotton has never yet reached the consumer, because it always takes time to do so, and in this case the rise has been frequently broken by severe and prolonged reactions, which have enabled manufacturers to avoid putting the price of the finished goods up to anything like the highest price which the cost of the raw material would have justified. The result is that the U. S. A. consumption of cotton of all kinds touched record figures during several early months of 1923 and their total consumption of American cotton for the season was actually 25% above pre-war (see Table IIIA). Although the rate of consumption in recent months is not as high as then, it is still well above pre-war figures. It is very noticeable that this increased consumption has been mainly in the South; in fact the Southern states stand to the New England mills in something of the same relation as the Indian mills do to Lancashire, though in much less marked degree.

U. S. and England Must Curtail

So much then for our review of world conditions; now we return to the question: If the world has got to cut its consumption of American cotton this year by say 2,000,000 bales against last year, and in future years by probably not much less, who is to do the cutting? India and China have already cut their consumption very considerably, and while still higher prices will certainly hit some classes of their consumers very badly, the main result will only be an increased inducement to use goods made of local cotton instead of American; and there is no very great prospect of relief in this tendency, because they have already done so to a large extent. As for the poorest countries of Europe they have already cut their consumption so low that they can hardly cut it much further, and probably the same is true of England as a whole. It is not very easy, therefore, to see how the old world can contribute much more to the necessary restriction; nor is there any accumulation of stocks on which they might draw, if it were only a question of temporary shortage, because these have already got down to minimum limits. It appears therefore that there is only one country where a really substantial restriction of consumption might take place, namely the United States.

There remains, however, the second question of the probable effect of the restriction on the manufacturing capacity of the various countries. Obviously no country has any right to expect that it will be able to maintain its pre-war output, when the world's supply of raw material has been reduced by about 30%. The only countries which are today known to be consuming more American cotton than they did before the war are the United States (including Canada) and Japan, and probably China also, but the 1913 figures are missing; but in the case of Japan the increase in American is not in proportion to the increase of spindleage, while in the U. S. A. it is greater. And as the total consumption of American cotton in Japanese mills is still under 800,000 bales per annum there is not very much margin there for restriction.

Roughly therefore, the position is that either England or America, or both, must cut their mill consumption of American. Which of these countries is in the better position to do it? In one way, undoubtedly England, because she has always had the lion's share of the fine cotton trade for which she uses mainly Egyptian cotton, and the supply of that is relatively at least, much better today than that of American and likely to continue so. It is true that other countries, especially America, have in recent years been tending to encroach on England's monopoly in this fine trade, but it is probable that when the competition for an insufficient supply becomes really acute, England will at least maintain her present share of that trade.

England's Fine Count Advantage

The advantages which England enjoys in the production of these fine goods lies in her possession of the best machinery for the purpose (note in Table I the large proportion of mule spindles in England), but perhaps even more in her possession of the most highly skilled labor in the world for the production of fine goods. Other countries have developed their cotton industries in various ways, e. g., India by cheap (and incidentally very inefficient) labor, or America by the adoption of automatic machinery which greatly reduces the proportion of labor cost. In the English industry,and especially in the finer sections of it, the skill of the operative counts for a great deal more than anywhere else; and in that respect she has certainly not lost ground since the war.

For a good many years before the war England had found herself driven more and more into the finer section of the trade, and the relatively high price of American cotton has strengthened that tendency again. There can be very little doubt, however, that the coarser end of the English industry will suffer; and this tendency has of course already been shown by the strenuous attempts recently made to introduce control. There never was, however, any prospect of success for these efforts except in the American section. Another straw which shows how the wind blows may be found in the fact that during the second half of the season 1922-23 England's consumption of Egyptian cotton actually showed an increase as compared with the first half of the season; as against decreases in every other section, and in almost every other country.

On the other hand, however, England's consumption of American cotton has already been reduced very heavily in recent years, so that it is unlikely that she will be able to do so again substantially. She might do so perhaps to the extent of a possible 500,000 bales further, but that seems the very most that could possibly be anticipated; it means a quarter of her present reduced consumption and would bring her below 40% of pre-war consumption.

Price and Consumption

We are driven therefore to the conclusion that the bulk of the restriction in the consumption of American cotton in future must be in the United States, not only because they have for some years been consuming much more than half of the crop, but also because their consumption alone has shown a tendency to increase which might conceivably be reversed. How this restriction is to be enforced, it is beyond the present writer to say. There are apparently only two ways, either by control (whether enforced by law or voluntarily adopted by the trade), or else by leaving it to the natural economic pressure of rising prices. And that only brings us back to the old question,—How high must prices rise in order to strangle consumption, and produce a consumers' strike, which would result in a really substantial reduction of the amount of raw cotton turned into goods? The answer obviously depends on general conditions outside of the cotton trade altogether, i. e., the purchasing power of the American public, and their consequent ability and willingness to pay higher prices for the goods. All that one can say in the meantime is that there is not yet any evidence of an actual consumers' strike and retail trade is apparently still going strong. The fact of the matter seems to be that the cotton trade and the world as a whole still refuse to face the situation, because they are not yet convinced that the state of affairs as it appears today is really going to last. Their ingrained optimism (for want of a better word) still leads them to cherish the hope that in spite of the boll-weevil we shall somehow get a big crop next year, and that whatever restriction of consumption may have to be enforced in the meantime will only be until the new crop comes. As indicated at the outset it is just barely possible that this optimism may be justified, but extremely unlikely. Before the end of this season we shall have the old talk over again,—markets denuded of goods and urgently requiring to buy more, but holding off in the hope of an easier supply coming, while manufacturers will be afraid to pay current prices, because of the heavy discount on futures for next season's cotton.

It seems impossible, therefore, to get away from the question of the immediate future, and take a long view of how the problem is going to work itself out over a period of say the next five or ten years. But from what has been said the writer's general view should be easily inferred. If the world is to adjust itself to an American crop of 10 to 12 million bales per annum for the next five years, the consequent restriction of consumption might be undertaken to the extent of possibly half a million bales by England, and perhaps half a million for the rest of the world. But that will still leave at least a million bales to come off America's consumption, which after all would only be 14% of her last season's consumption and would still leave her far above pre-war figures.

U. S. Must Use Less, or Grow More

In the consequent readjustment of the productive capacities of England and America, it is probable that England will come out on the whole rather better than America, because she can more readily turn over to Egyptian cotton and other outside growths, and can to some extent make up in the fine section of the trade what she loses in the heavy end. It must be remembered that England is more accustomed to using different kinds of cotton and has learned by bitter experience of the necessity of cutting prices, how to get the best possible results out of every kind and grade of cotton. It is of course, possible that America may do the same to some extent; she might use more Indian and Chinese cotton as well as Brazilian, Peruvian, etc., and the New England mills might also find it worth while to develop still further their production of finer goods from Egyptian cotton. But in all these directions America has more to learn than England, and her progress will probably be slower.

It seems therefore that the only definite conclusion which emerges from the whole matter is that the United States must make up their minds at the earliest possible date to use less American cotton,—or else to grow more!

The Textile Employe as a Stockholder or Partner

The Desire and Demand for Such Association is Seldom Strongly Manifested and Must be Encouraged by Proper Educational Methods—Some Successful and Unsuccessful Plans—Details of Swift & Company's Successful Procedure

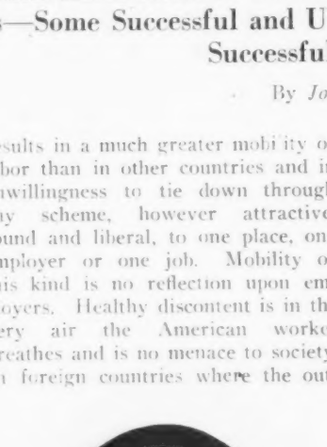
By *John Calder**

VERY few of the examples of profit-sharing in the United States can strictly qualify as such according to the definition of the International Conference on Profit-Sharing held in Paris in 1889, viz: "Profit-Sharing is an agreement freely entered into, by which the employe receives a share, fixed in advance, of the profits." This rules out all bonuses or gift propositions now loosely classified with profit-sharing and all compulsions of every kind to which a tentative reward is attached with a rather insecure fastener. Nevertheless, there is no call for a fastidious doctrinaire attitude in the premises. All experimentation is worth watching and analysing for its significant features and results. These results are no longer a matter of doubt as to "Stock-holding."

"Profit-sharing" and "stock-holding" differ in theory by the fact that the profit-sharer has a share only in the cash profits of his employer over a given period, and may carry off his share in its entirety; whereas the co-partner or stock-holder must take some of his profit in the form of investment in the business and receives also some share in the management. The co-partner or stock-holder naturally tends to become less willing to leave his job, and this is a bad mark for the practice in the eyes of official unionism. Various forms of special inducement to start investment in the business are in use in Europe and the United States, but in America at least, those of the 42,000,000 gainfully employed persons who are wage and salary earners, quite apart from union influence, show as yet little interest in assuming risk as well as in accepting privilege and are decidedly lukewarm, in industry in particular, towards any form, whether in wages or profits, of long-deferred reward.

Individuals among employes will always furnish exceptions in the matter of qualifying as savers of capital. It is found that a considerable minority will readily and spontaneously avail themselves of all kinds of stock-owning and other thrift opportunities but that the general body of workers in America as yet react as stated.

It is largely a matter of education, of growth of confidence in capitalism, and of environment; and free experimentation should be welcomed without predicting any miracles or disasters. In boom times, or in times of labor scarcity in the more recently industrialized places, the ambitious and restless energy of the American results in a much greater mobility of labor than in other countries and in unwillingness to tie down through any scheme, however attractive, sound and liberal, to one place, one employer or one job. Mobility of this kind is no reflection upon employers. Healthy discontent is in the very air the American worker breathes and is no menace to society. In foreign countries where the outlook seems bleak to labor, it does all it can to intrench and economize, hence the much greater vogue of co-operative societies, the more intelligent use of them there and the greater popularity of thrift measures. In industrial relations the position should be taken that each new departure in regard to them should justify itself on two sound business grounds: either it must draw capital and labor into greater accord (improve their feelings about one another) or it must promote the efficiency of production.



John Calder

Judged by these standards does profit-sharing as a whole in the form of a cash distribution out of profits, rather than according to profits, justify itself? The conclusion of the writer is that it does not, notwithstanding the proved success of what are merely a few special cases.

Ordinarily the profit-bonus receiver soon comes to look upon it as a yearly gratuity and when it fails to materialize he is inclined to find fault. In addition his long-deferred extra reward is remote from his daily performance and fails to stimulate it, and when his reward vanishes altogether he is discontented just as he is when wages cease or are necessarily reduced.

Psychology of Stock-Ownership

Cash profit-sharing accomplishes little in reducing industrial discontent because it does not change in any degree the status of the wage-earner. It merely implies that labor will perhaps receive a variable, uncertain and deferred addition to its income, and that over this possibility it has no control in any degree. Out of the fruit of the business the interests of the ordinary stockholder are first taken care of and frequently, and often necessarily, "there ain't going to be no core." To this, however, the wage-earner will make no objection as a rule if his employer will avoid putting him in the false position of possibly getting something which he did not earn.

Cash distribution of profits to partners who have not qualified by contributions means frequently that wage-earners, most of them with no desire whatever for stock-ownership and no knowledge of the rights and obligations involved, have these responsibilities thrust upon them by well-meaning employers. But it is wrong first to bestow and then try to enlighten the worker as to the meaning of the gift, whether the gift be cash profits, enhanced wages, a shorter working day or company stock.

The Creation of Appreciation

The primary need here, as in all industrial relations is education towards appreciation and desire. The employe sincerely desires a higher status than that of a mere wage-earner or purveyor of a marketable commodity termed "labor." The greater power and importance he seeks mean greater obligation. The new functions he assumes demand new knowledge. The higher earnings he attains mean that he must face greater risks. The fact is that a large proportion of our 42,000,000 gainfully employed people are not yet far-seeing enough to respond to these challenges from industry, or even from business, for a deferred reward. Nevertheless, genuine ownership-sharing is a most hopeful development, far exceeding in its possibilities capital's more numerous but less fruitful gift propositions.

The fundamental condition of success is the education of the individual wage-earner towards a sound comprehension of the responsibilities involved in stock-ownership. This is necessarily a slow process and in the writer's experience it involves well-considered educational courses conducted separately for foremen and employes. The only guarantee for the desired success is to teach labor to sacrifice something for the greater good it desires to attain, and contributory ownership, the writer believes, is the best means of developing this feature.

It involves six successive steps, namely appreciation, desire and effort, followed by automatic and natural selection of the wage-earning stockholders, then real control by real owners, a true investment for higher wages, and a gradual elimination of the distinction between owner and worker.

In fact, the process is simply another illustration of the psychological ladder of achievement with its six ascending rungs—Attention, Interest, Vision, Action, Repetition, and Habit. It need hardly be said that in a mill with arbitrary overseers or autocratic management, or large labor turn-over, or ungenerous wage policies, the less said about stock-ownership, the better.

Methods of Ownership-Sharing

The three chief ways by which the ordinary wage-earner may acquire stock in a mill are: 1, Direct purchase; 2, Profit-sharing allowed to accumulate as capital in the concern with corresponding issues of stock to the employe; 3, Gifts of stock to workers in consideration of length and character of service and with or without any contribution to the company's capital.

The combination of profit-sharing without any actual distribution of the profits in cash but with automatic accumulation of it in the capital of the business is the most educative and successful of the methods named. The textile industries at Guise in France and the London Gas Companies are outstanding examples, though it should be noted that profits are guaranteed by law to the latter.

It is best of all when the worker makes his capital contribution in cash directly and intelligently, but experience shows that few workers will do so unless offered stock terms much superior to those which are afforded to the public.

The Taylor Plan

In Great Britain, outside of the gas companies with their protected profits, there is practically only one straight co-partnership scheme of long and successful duration and it happens to be a textile one; that of J. T. and J. Taylor, Ltd., woolen cloth manufacturers of Batley, Yorkshire. Begun as long ago as 1892 by Mr. Theodore C. Taylor when he became the sole owner of the business, it was the climax of his altruistic ideals as an employer, his chief desire being to improve the status of his employes

* Pres. Royal River Manufacturing Co., Yarmouth, Me., formerly Manager Industrial Relations, Swift & Company.

From 1892 to 1896 it was, like the seventy-nine year old Leclaire scheme in France, confined to managers and foremen, but in the latter year it was extended to the employes, about 2,000 persons in all. The profit remaining after expenses, fixed charges, wages, and 5% on capital have been paid, is divided at the same rate per cent between wage-earners and capital and about 500 of the adult workers with over 5 years service get a double bonus. The bonus is paid wholly in stock, only the dividend on the stock being distributed in cash. The ownership-sharing in this textile concern has been recently combined with an effective Employes' Representation Plan on joint-conference lines similar to those advocated by the writer. This conference covers all matters relating to employment and working conditions, and being virtually a conference of representative owners as well, business affairs are also discussed as called for. With considerable labor of minors and with female labor of relatively short duration this plan tends to greatly strengthen the permanent employes just as the LeClaire scheme does.

The Lever Brothers' Plan

Lord Leverhulme's company, thirteen years after the Taylor textile scheme was installed, approached the subject of ownership-sharing solely from the angle of using it as an incentive to increased efficiency of production, it having been satisfied that a straight wage incentive would not improve results greatly.

The method adopted was that of a "partnership certificate" plan with numerous restrictions and counter-checks which have proved exasperating and unpopular to a number of the employes.

This plan holds down real employe stock-ownership to a maximum of less than 2½% of the total capital. It is essentially a paternally conceived and administered scheme aiming primarily at increased production and causing larger earnings through bonus stimulations of a complicated character. It provides no real change of status for the wage-earner and it offers a maximum of weak points for union criticism.

These two English schemes are typical of the spirit and method of others. They illustrate the broad and the restricted view respectively of ownership-sharing by employes as held by capital and the long and the short results which correspond.

United States Steel Plan

Of the numerous ownership-sharing schemes for employes in the United States few are more far-sighted and promising than that of the United States Steel Corporation. It will reward close study by all representatives of capital. If this scheme is followed by a correspondingly liberal share of democracy in the employment relation, it will place the Corporation in the front rank of liberal enlightened capitalism. Under the plan started in 1903, the Corporation advances money at 5% interest for the purchase of stock, offered at a discount, and accepts repayment by installments over a period of three years.

Considerable bonuses in addition accrue to employes who retain their stock and also their connection with the Corporation. After being fully paid up the owner may sell out, if he chooses, but extra dividends accrue to those who retain their stock. The Corporation's plan is one of the few where ordinary stock is offered without irksome restrictions tied to it.

Swift & Company's Plan

As an outstanding example out of many hundreds in use, of a successful employe stock-ownership plan in the United States, that of Swift and Company, meat packers, with whom the writer was identified for some time, is briefly summarized here. It has been in operation for nearly five years.

The Company had on January 1, 1924, over 46,800 stockholders; 14,000 of these were employes with fully paid-up holdings of nearly $20,000,000 of stock.

In addition to these several thousands of employes were acquiring stock by an installment plan on which shares are sold at the market price, on a 10% cash payment. The balance of the payment is spread over two years and on this the employe pays interest of 5% while receiving dividends of 8%. The stock-savings plan which several thousands of persons have used, gives employes of six months service a chance to purchase a limited number of shares, between one and five and varying according to earnings, and to pay for the stock within two years. Details of both the Swift Stock-Investment and Stock-Savings Plans are given and it should be noted that there is nothing in them which is not equally applicable to any stablized textile concern which has succeeded in gathering together a corresponding stabilized force of overseers and mill workers.

Management-Sharing

The very frank participation of workers' representatives in employes' assemblies of the democratic type advocated and installed by the writer is in no way regarded by them as "Management-Sharing" in the sense of responsible participation in the conduct of the business in executive affairs. Loosely phrased implications that management power is conveyed are to be found in some representation plans and the press frequently confuses "representation" and "management." In the best plans the employe manages usually very competently his own business, but not that of the concern he works for.

There is yet much to be done before American ownership and management begin to give the worker "what he wants" and what is entirely good for industry, capitalism, and the public that he should have. Ownership-sharing without any control is meaningless and exasperating, and control without ownership is foolishness. Yet capital has perpetrated both of these mistakes in some instances.

Management should concentrate diligently upon the psychology of the worker and upon his natural desires. It should know them, understand them, sympathize with them and then work out adequate satisfactions with little or nothing of the gift element in them. Some of the most disgruntled and disillusioned employers are those who have foolishly given much to their employes that the latter did not want and yet have withheld elementary rights from these same individuals.

The American worker in general has little desire and practically no equipment for a place at a directors' board, for responsibility, and for intervention in running the business as a whole. He is also far from approving or describing the ambitious schemes of some of our "sociologists-in-a-hurry" for projecting the wage-earner "willy-nilly" into such a position.

Those ideas of self-expression and self-determination in ownership, which they insist are for his good (even if he doesn't know it) are put forward in part by people who are often astonishingly ignorant about industry outside of what is printed and talked about it in a restricted circle. For the predominance of the amateur in this field, capital has itself to blame. Yet progress and free experimentation are of the essence of things.

"Paternalism," both benevolent and otherwise, "Socialism," and "Leaving things alone," have all had a trial and have failed during the past decade. Why not aim sincerely, simply, and directly at the general welfare, cease patronizing the employe or pitying him, help competently in his education and await the time when the enlightened employe will voluntarily go out with his skill and accumulations and "hire capital" at the good rent it will always command in the United States? All of the best industrial policies and administrative labor practices today are simply preparation of the worker to this end. When the American workman does so act he will have sensed the immutability of certain economic laws, as enduring as the habitability of our planet, and he will not seek to excuse the mistakes which he reserves the right to make for himself, or ask any of his fellow-men to plead guilty to them.

Regarding the real and the alleged benefits to employer and employe of the relatively few profit-sharing and quasi-management-sharing plans operating in the United States, it is decidedly uncertain to what extent economy of time and material, improvements in quality and quantity of output, inducements to thrift, avoidance of economic friction and a sense of fair treatment have been derived from their very limited use so far.

Certain it is that all of these benefits can and often do accrue through direct action by skillful administration to these ends, through competent, sympathetic, and understanding supervision and inspiring leadership of the worker at his work and on no other basis than the mutually satisfactory wage contract collectively arrived at, with democratic provision for its periodical revision. This in no way rules out the interest of the worker keenly in his job and the using of his creative instincts to improve it, himself, his earnings, and his prospects, but the latter is not "management-sharing" in any responsible sense in a business, though it is an essential step toward the worker's evolution in that direction. A greater willingness on the part of wage-earners to tie-up to profit-sharing and also stock-ownership has been observed by the writer on the part of employes working for concerns whose mills are isolated and whose workers live in small communities created and sustained by the existence of one industry. Under such conditions if the industry is fairly stabilized, the labor turn-over is low, the worker's home and social conditions are stabilized also, and it is his wish that this should be so. Such conditions, however, are exceptional and the mobility and restless desire of the American worker in urban areas operate as effectively against an interest in profit-sharing as they often do against cooperative buying and other thrift practices. Labor rightly protests at the use of profit-sharing to weaken its economic strength or the implication that it owes the employer any consideration on that ground. Wise employers will keep the relationship wholly separate from the wage contract.

Overseers as Partners

In conclusion, no textile employer in our day should fail, wherever possible, to tie up to himself by real responsible partnership his indispensable and often permanent operating executives. All of these, including the more stabilized mill overseers are, in any carefully organized business, taking proper concern about the quality of its personnel, and are more or less capable of trust and participation in management of the concern as well as of supervision of its processing departments and people.

We noted at the beginning of this article that the Leclaire establishment in Paris 79 years ago concentrated upon its permanent group of 43 people as its partners and management-sharers and it still confines that privilege to the same group, the voice of the general body of workmen profit-sharers being much less in the board of management.

America might well "creep before she walks" in this respect also, and afford a very liberal measure of ownership and management-sharing in the first instance to the 800,000 men and women, overseers and executives in our mills and industries who constitute the actual practical leadership of labor at the job.

Meanwhile, it is the writer's belief,

that "education by doing" is the most hopeful course for the employer to take with the wage-earner. Schemes which build up into capital investment what a worker has really earned, with of course his willing co-operation, and which readily capitalize his savings will gradually transfer the more intelligent and far-seeing from ungrateful contemplators of a meagre bounty or a disappointing dividend, to patient owners and boosters of a visibly growing equity.

APPENDIX

Swift and Company Employes' Stock Investment Plan

1. Employes may buy one to fifty shares, according to wage or salary.

2. Stock is bought by the company and sold to employes at the prevailing market price.

3. Employe is required to make an initial payment sufficient to reduce his debt to not more than $100 per share; no initial payment to be less than 10% of the purchase price.

4. Stock certificate is issued in name of the employe when initial payment is made, and all dividends and rights of every nature accrue to the purchaser as a stockholder of record.

5. Employe must give his collateral note for balance unpaid, together with stock certificate and power of attorney to transfer.

6. Employe authorizes deductions from salary or wages at rate of $1.00 per week for each one share bought. Accounts must be paid within two years of date of purchase.

7. Interest at 5% per annum is charged on unpaid balances.

8. Additional payments may be made on the account at any time in any amount. Dividends may be applied in payment on accounts.

9. No employe may have more than one open Employes' Stock Investment account.

Employes' Stock Savings Plan

CHICAGO, Ill.

Employes of Swift and Company:

To encourage saving on the part of its employes and with the particular purpose of interesting in Swift & Co. stock those employes who are not now shareholders, especially the plant employes, the directors of Swift & Co. have decided to sell a portion of the Swift & Co. stock held in the treasury to employes at One Hundred Dollars ($100.00) per share.

This offer is open to all employes, whether they are stockholders or not.

In order to participate in this plan, employe must have been in the service continuously for not less than six months, but employes who have been absent with the colors are considered as having been in continuous service.

Amount of stock to be allotted to each employe will be fixed according to wage or salary, ranging from one (1) to five (5) shares, as follows:

Weekly Wage or Salary	Entitled to Shares
Up to $20	1
$20 and up to $30	2
$30 and up to $40	3
$40 and up to $50	4
$50 and over	5

This privilege to our employes is not transferable.

If an employe for any reason withdraws from the plan or leaves the service of the Company within six months, his participation in this plan is automatically cancelled and his payments will be returned to him with interest.

Stock is not to be transferred or delivered until fully paid. No partial deliveries of stock will be made.

Stock may be paid in full at any time before the expiration of the two years, and at least at the rate of one dollar or more per week to be deducted from the wage or salary of the employe. Interest on partial payments at 5% per annum will be credited when final payment on the stock is made.

Dividends on stock will not accrue until stock is fully paid.

Subscriptions will be accepted in the order received, and the directors reserve the right to withdraw this offer or reduce allotments when supply of stock available has been exhausted.

This offer is made with the idea of enabling larger number of our employes to become shareholders; and in consideration of the favorable basis on which the offer is made, it is our desire that our employes retain the stock as an investment.

Any attempt by any employe to acquire stock under this plan in excess of what he is entitled to or for other than investment purposes will be looked upon by the company with disfavor, and will cancel the employe's rights under this plan.

(Signed) L. F. SWIFT,
President.

Outlook for Wool Goods in 1924

Cutters in Position to Buy Normally With Light Stocks — Retailers and Consumers Able to Buy

By *A. D. Whiteside,* President, National Credit Office, New York.

DIFFERENCES of opinion in the discussion of any subject are usually caused by not defining the exact subject to be considered.

So, in discussing the probable welfare of the woolen and worsted industry for the next two seasons, it is essential first to determine what, to the average manufacturer, constitutes a satisfactory condition of the industry.

It would seem reasonable to suppose that a normal year would be considered satisfactory, and that a normal year in the woolen and worsted industry would be one in which the weavers of cloth would find their market in a position to absorb the average mill output of the last five years.

During the four years 1919-1922 inclusive, the weavers of woolen products marketed materials valued at $757,458,000.

The point now under consideration is —

Are the mills beginning with the Fall openings in February going to find an average market for their product, and will these weavers continue to market the average amount of cloth for the Spring of 1925 when the openings for that season occur in July and August of this year?

Without doubt, normal trade will depend upon the condition existing with three primary factors:

(1) The consumer

(2) The retailers distributing wearing apparel

(3) The cutters of cloth, that is, the manufacturers of men's and women's wear.

Should the condition of these three primary factors be normal or better, there is little doubt but that the woolen and worsted piece goods manufacturers would have two satisfactory seasons ahead of them.

It is not impossible to visualize with a fair degree of accuracy, the general condition, from the standpoint of absorbing woolen and worsted products, of each of these divisions.

The Consumer

During the last five years, the consumer has absorbed woolen and worsted piece goods valued at $2,404,630,000 and of this total, $1,009,944,600 was the average paid for Spring and Summer merchandise and $1,394,685,400 for Fall and Winter products.

During the year 1923 there is every reason to believe that this amount was purchased by the consumer. There is not the slightest indication at the moment that the consumer will purchase less than this amount during the coming twelve months.

Distributing Wearing Apparel

The retailers during 1923 did an annual business, on the average throughout the country, of 10% in excess of 1922. These retailers paid the manufacturers of apparel, on the average for the last five years including 1923, $1,683,241,000 for woolen products and successfully marketed these purchases.

It is apparent, from the financial statements submitted so far by the retailers, that the stocks of merchandise on hand throughout the country are light.

Cutters of Garments

The manufacturers of wearing apparel, particularly men's wear, made purchases of piece goods in July of 1922, for the Spring of 1923 that would have compelled the consumer to absorb $1,539,323,000 in woolen products, or a 50% increase over the average Spring consumption of $1,009,944,600 plus a normal 10% increase.

The retailer in constant touch with the consumer bought normally for that season, leaving a carry over of merchandise with the manufacturers of apparel of 40% in the Spring of 1923. This carry over naturally flattened the market for the mills for fall shipments for this year and reduced the piece goods purchasing power of the average manufacturer 40% for the spring of 1924.

The average manufacturer of apparel made only 60% of the normal spring purchases for the coming spring. As these manufacturers, principally men's wear, bought only 60% of the average requirements for the spring of 1924 and as they carried over only 40% or less from the spring of 1923, they now have a fair average stock on hand for the coming season.

The comparative failure record of the cutters for the last three years is as follows:

	Men's wear	*Women's wear*
1921	121	103
1922	129	139
1923	98	80

This year, the woolen and worsted mills purchased 35,077,000 fewer pounds of wool between June 1 and October 1, 1923, than during the same period in 1922.

It appears now as though there would be a normal turnover of merchandise in the woolen and worsted industry for the year 1924, starting with the openings for Fall in January and February.

The following facts may be reassuring:

There are in this country, at the present time, 1,024 manufacturers of cloaks and suits and 1,828 manufacturers of clothing able to pay for and in a position to absorb their normal merchandise requirements for the coming Fall.

No Unsettling Issues

By *John Bancroft* *

I believe in certain years, through fear of voters, serious economic and political questions did have some effect upon business, but the questions raised in those years have all been settled, and if you were to ask me whether I thought the present Presidential year is likely to be synonymous with poor business I should most emphatically say "no," as the before stated reasons do not enter so largely into it. I also believe that the prospect of a reduction in federal taxation and the continuance of the present administration should make every business man look for a year of full employment.

* President, Joseph Bancroft & Sons Company.

Progress in Industrial Relations in 1923

Year Has Been Devoid of Spectacular Developments But Steady Progress Along Sane and Sound Lines Has Been Made—Employe Representation Has Been Gaining Ground and Has Been Emphasized as Method of Securing Reactions, Rather Than Re-Apportioning Responsibility

IN reviewing the progress made in the development of better industrial relations in the textile industry during the year 1923, there are no spectacular high lights such as those which featured this phase of management in the mad years which followed immediately after the World War. There has been no wild scramble for emergency plans; no disposition to try out any hastily conceived method which offered some slight promise of correcting the lack of mutual understanding which makes itself apparent during alternating periods of prosperity and depression.

This does not imply in the least, however, that there has been no progress made in this direction. On the contrary, the year will go down in the annals as one of thoughtful and broad-gauged development along human lines. The weeding-out process, which was undertaken as soon as the reaction from post-war inflation set in and which entailed the evaluation of the myriads of employe service plans developed during that period of labor scarcity, has continued. But hand in hand with this rather negative process has gone a positive development of new plans based on a clearer understanding of the human needs of industry today.

In fact the entire course of events in industrial relations during the last year furnished additional proof of the fundamental statements made in these columns during recent years, namely, that the science of industrial relations is not a new hobby devised to meet emergency conditions but is instead the continuation of a policy which has been taking shape definitely and continuously over a long period of years; and that interest in this subject did not subside with the reaction from abnormal manufacturing conditions but is rather a definite part of the business of textile production, irrespective of changing economic conditions. As such, it is as live an issue today as it was four years ago and its developments are as much a matter of general interest as ever.

Employe Representation

One of the outsanding developments of the year was the increased interest in the phase of industrial relations which is most commonly expressed by the term "employe representation." Not only have additional mills in the North initiated some form of this machinery, but it is known that many more are investigating possibilities in this direction and will undoubtedly join these ranks in the next year or two.

The reason for this development is an interesting one. While opinions may differ on this subject, there is a widely growing belief that much of the antagonism to proposed plans of employe representation was due to a misunderstanding of its aims and purposes; and that much of the progress made recently has been due to a clearing of the air.

There is no doubt that shop committees, Industrial Democracy and other forms of representation have been regarded by many manufacturers as types of radicalism which have tended to upset the existing industrial order and to divert the responsibilities of management from forces where they belong to shoulders less able to bear them.

The refutation of this impression has been one of the noteworthy recent achievements. In its place has grown up a realization that the fundamental purpose of any machinery of employe representation is to provide an orderly channel for the passage of the reaction of workers to their employers, and the ideals of management to its personnel. This has been emphasized before but deserves repetition. The outstanding evil resulting from the growth in size of manufacturing organizations, particularly when, as is true in the North, the units are composed of a mixture of nationalities, creeds and ideals, has been that neither management nor personnel has been able to obtain a correct index to what the other side is thinking; consequently valuable contributions from workers to manufacturing problems have been lost, while harmful impressions, based on misunderstanding, have smouldered under the surface and have many times burst forth into what appeared to be spontaneous combustion.

The Pacific Plan

It is impossible here to mention all the concrete developments along the lines of employe representation which have been noted during the last year, particularly since many are still in embryo, but it is of interest to touch on one or two plans which typify some of the recent achievements.

Probably the outstanding news along this line which broke in 1923 was the announcement of the plan devised by the Pacific Mills of Lawrence, Mass. This plan has been described at length in these columns and was also the subject of an address at the fall convention of the National Association of Cotton Manufacturers. Consequently it is not necessary in this review to detail the machinery created by the plan. It is, however, pertinent to repeat the plan and scope as outlined by the organization itself, as follows:

"The purpose of this plan of employe representation is to promote understanding and fair dealing between management and employes by

(a) Providing the employes with the means of expressing to the management their opinions on all matters concerning their working conditions.

(b) Providing the management with the means of consulting with the employes on matters of mutual concern.

The committees to be established under this plan are advisory and are for the purpose of assisting the management in making its decisions with due regard to the point of view of the employe."

Started last February, it is possibly too early to appraise this plan, but it is interesting to reprint the opinion of H. Gilbert Francke, service manager of the Pacific Mills, as published in a recent issue of the *Pacific Mills Bulletin*:

"Both the management and the employes have received material benefit from our plan, better running work, suggestions for improving quality, the sick benefit plan and numerous conveniences for the employes. These benefits are relatively unimportant as compared with two rather intangible but far-reaching benefits. The first of these is that both the management and the employes understand each other's problems better today than ever before. The day-to-day transactions of the Shop Council have revealed to the management some of the troubles and problems that the employes face and likewise the employes have seen some of the questions that have to be tackled by the management. The better we understand each other the more nearly can we arrive at a common point of view which in time will mean everything to us.

"The other big benefit from employe representation is that it has proved that leading is better than driving, whether it be driving on the part of management or on the part of employes. When either of these groups has pointed the way and shown through recognized leadership that it is the proper way to go, then we have arrived together, but when either of these has threatened or attempted to take arbitrary steps to force a point, then we have split apart and caused misunderstandings.

"Therefore I look ahead into 1924 with great confidence that in spite of obstacles that may confront us we will prove together that fairness, frankness and cooperation will result in the successful conduct of industry."

The Cheney Plan

Another large textile organization which developed the plan of employe representation during the year was Cheney Bros., of South Manchester, Conn. The machinery is comprised in a body known as the Works Council and the purpose is "to secure closer and easier contact between the management and employes." This plan was worked out after careful study of similar methods and operation in various parts of the country. Representatives of the employes and of the management chosen to act in the Works Council "shall confer upon such matters of mutual industrial relations as either may wish to have considered."

That the aim of this plan is along the lines emphasized at the beginning of this article is apparent from a reading of the scope of its deliberations. It was agreed that "the management shall explain its employment policies and practices and in general advise with the employe representatives on the Works Council in reference to matters concerning industrial relations;" and further that the employe representatives "shall advise and make such recommendations as to working conditions, methods and processes as they may consider advantageous to the employes or to the company."

Industrial Democracy

In addition to these and other new plans, it is pertinent to inquire into the degree of success featuring methods of longer standing in the textile industry. One plan which has always attracted considerable attention and which has been installed in a number of textile mills is the John Leitch plan of Industrial Democracy, providing for both a system of employe representation and of "economy dividends" which shall reflect in the pay envelope the tangible results to the workers of greater effort by them.

It is significant to note that, with one exception, this plan has continued to function in the plants where it was installed and is evidently giving satisfaction. One firm which has operated under this method for some years is the Riverside & Dan River Cotton Mills of Danville, Va., and the following statement made to a representative of TEXTILE WORLD by H. R. Fitzgerald, president and treasurer, is of interest:

> "Our system of Industrial Democracy has continued to function in a thoroughly satisfactory manner, and has been mutually helpful both to the management and the operatives. There is a gradual increase in the spirit of cooperation which of course has its effect upon the life of the

individual as well as upon the organization, and has aided greatly in creating an atmosphere that makes for a happier and more satisfactory life in all respects."

Still another organization which has been operating successfully under the John Leitch plan is Sidney Blumenthal & Co., Inc., owners and operators of the Shelton Looms, at Shelton, Conn. In answer to a question propounded by a representative of TEXTILE WORLD as to how Industrial Democracy has been operating in his plant, Sidney Blumenthal, president of the company, remarked that Industrial Democracy itself never does anything; but that on the other hand the question whether good use was made of the Industrial Democracy idea is a searching one. Mr. Blumenthal stated further as follows:

"Industrial Democracy is a plan and, when properly organized, a tool, serving no purpose whatever except that which sincere users and sympathetic coworkers for a definite common objective want to make of it. Any other plan or any other tool, if designed to be used to such ends, will be serviceable in like degree if it is fitted and if honestly applied.

"I believe that the plan of Industrial Democracy continues to serve that purpose in joining the efforts of the workers and management in our mill.

"What we are after, is high quality of workmanship in our output, and cooperation in our production departments towards both excellence and quantity.

"In spite of irregular trade conditions, we have, with the cordial support of our employes, operated on full time with the largest percentage of machinery in the history of the company.

"The various forces in our organization are more than ever aiming at standardized, scientific methods, backed up by study as well as experience and with the hearty assistance of all concerned. In a considerable measure, Industrial Democracy is helping us along this road."

Other Phases

Although this subject of employe representation is the most interesting phase of industrial relations at present because it seems to strike at one of the main problems growing out of our complicated system, there are many plans which have been gaining momentum and have been contributing their share to the bringing about of a more active realization of the mutuality of interest between management and employe. For example, the practice of providing group insurance to the workers, thus contributing a sense of security against sudden tragedy, has become even more wide-spread and is now a generally accepted policy among a large portion of textile manufacturers. In addition there has been further consideration of plans to provide sick and health benefits, old age pensions and unemployment insurance and these phases may be expected to become further emphasized as the years go on. The common purpose of this class of plans is to lift from the shoulders of the employe the constant dread of a curtailment of their earning capacities, which has been found to impair their value both to the companies and themselves.

As to such plans as first aid facilities, sanitation, safety, social and recreationial provisions, educational activities etc., these have become such usual features of manufacturing organizations as to scarcely warrant comment. In all this work, the guiding principle, becoming more important as years go on, is a disposition to guard against any tendency towards philanthropy or paternalism. The motive is rather to provide employes with facilities which they could not otherwise possess and to allow them to develop the use of such facilities themselves.

Developments in the South

In the southern textile industry, developments in industrial relations during the year have been naturally along the lines of improvement of community facilities. With few exceptions, manufacturers in that section have not found it necessary to develop plans of employe representation to provide formal machinery for mutual interchange of reactions.

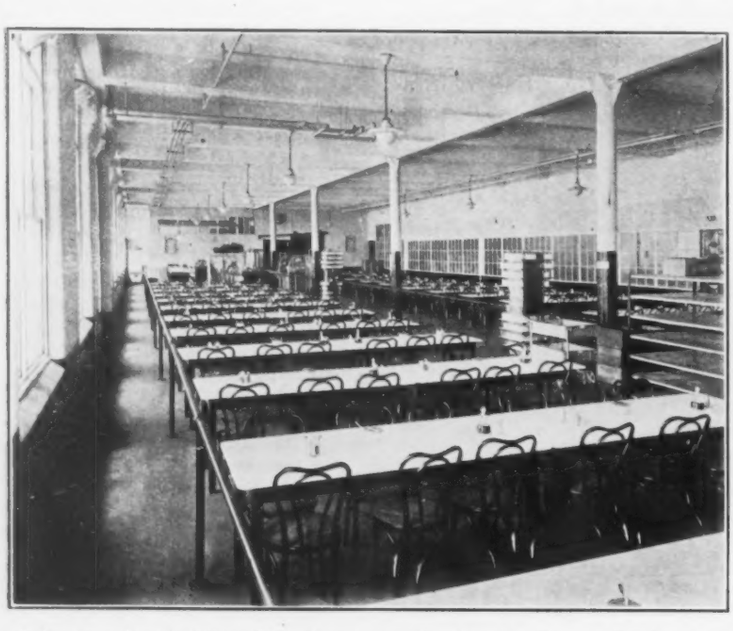
It is interesting to note in connection with village arrangements in the South that the tendency has been toward improvements of housing facilities. The many new plants being erected, in that section have involved the development of villages, the houses of which are all provided with bath rooms, sewerage, running water, electric lights, etc. In addition the houses of old-established mills, which were not originally equipped with these conveniences, are in a great number of cases being overhauled and brought up to date. The old type of mill house which has been so severely criticized by theorists and which, it is true, in the aggregate often gave the appearance of an unsightly community, is fast disappearing. Homes of attractive individuality and arranged on carefully planted streets are taking their place and are proving important 'factors' in holding workers in the mills. This too has not been due to philanthropic intentions but is rather the inevitable result of the competition experienced from those mills which were the first to provide more attractive facilities. It is also interesting to note that in many of the newer mills there is a tendency to increase the nominal rental charged so as to place the village investment on something more nearly approaching an economically sound basis.

In addition there has been an increasing enlargement of educational facilities both as regards grade schools and vocational training. More and more communities are providing high schools extensions to the systems already in force and are giving the lie to agitators who have claimed that it is the policy of southern manufacturers to limit the educational advantages in their communities so as to hold employes forcibly in their mills. It is increasingly evident that manufacturers in that section have enough vision to realize that the good to be gained from an enlightened citizenship far outweighs the disadvantage which may result from increased turnover of village inhabitants as education calls them to broader fields.

Summary

None of these statements may be considered as blanket descriptions. It is self-evident that an entire industry does not progress at the same rate nor in exactly the same direction. There are always certain organizations which lead the way whether it be along the lines of technical achievement or human accomplishment. Others profit by their example or are forced into line by the laws of competition. However it is safe to say that textile manufacturers as a class have tackled this problem of industrial relations in an honest and sincere manner and that any weak spots which still persist are due not to indifference but to insufficient knowledge or uncertainty as to the soundness of particular plans.

The year 1923 must be recorded not as a period of sensational developments but as one of steady and satisfying progress toward a goal which becomes more clearly outlined each year.



Cafeteria at Pacific Mills. This Organization Developed a Plan of Employe Representation in 1923.

Ware Shoals Inn, Opened in 1923 by Ware Shoals (S. C.), Mfg. Co., One of the Latest Developments in this Interesting Mill Village.

Relation of Mutual Adjustment Bureau to Trade

Established by Sellers it has Met With Hearty Cooperation of Buyers in the Cloth and Garment Trades—That Impartiality of its Decisions is Gaining Favor With Manufacturers of Piece Goods Fully Demonstrated—Details of Procedure and Scope of Operations

By *J. J. Nevins*, Secretary-Treasurer

THE Mutual Adjustment Bureau of the Cloth and Garment Trades, will close its fifth year in April, 1924. This fact furnishes a convenient opportunity to review its work and consider its accomplishments.

Necessarily it was in the nature of an experiment. The need for something of the kind was long obvious but that buyers and sellers could organize an institution which would be governed and controlled by them mutually was, in the minds of a good many, necessary to demonstrate. Moreover, there were those in the market who believed that the principle upon which we were proceeding was wrong. These contended that the problems we were organizing to deal with were not mutual problems.

After five years of existence it is gratifying to be able to state that the experiment has ceased to be an experiment and that the theories upon which the organizers of the Bureau proceeded were right.

Origin of Bureau

It might be well for a moment to consider the situation which seemed to make necessary the bringing into being of such an enterprise as the Mutual Adjustment Bureau of the Cloth and Garment Trades.

We begin by having to admit that it is not possible to make a perfect piece of cloth. Such are the exigencies of manufacturing in the woolen business that a super-critical examination would find imperfections in nine hundred and ninety-nine out of a thousand pieces manufactured. This at once opens an opportunity for difference of opinion and raises the question, as to how far from theoretical perfection a piece of goods may depart and still be a normal delivery. This is the question with which the sponger who is the agent of the cloth buyer and the adjuster, who is the agent of the mill have for years grappled, and expediency and trading inevitably crept into the activities of these two agents. There was no court or arbiter to which these disputes could be referred. They had to be fought out along the most strategic lines that the respective combatants could think of.

Manifestly a situation of this kind was unsatisfactory. It was evident that some kind of court of last resort, some sort of tribunal which could be depended upon at once to examine merchandise expertly and competently and render impartial and disinterested decision was essential.

A plan for meeting this situation was evolved by several factors in the market who fully appreciated the conditions and thereafter the problem became one of interesting the buyer in such an institution. The first effort was with the then National Association of Clothiers.

Interesting the Buyer

After some study and investigation leading clothiers in the association foresaw advantages in the arrangement and the plan was presently approved and accepted at a general meeting of that body. Thereafter the work of organization was simple. The Clothiers' Association was asked to appoint three representatives, the American Association of Woolen and Worsted Manufacturers appointed three, the Cloak, Suit and Skirt Industries appointed three, the Jobbers one, and the Tailors to the Trade one. So that the spongers and mill adjusters, who were immediately concerned would have no misgivings and no misunderstanding as to exactly what was contemplated the Spongers' Association was asked to appoint a representative on the Board of Governors and the Mill Adjusters were brought together and it was pointed out to them that if they had an organization they would be invited to appoint a representative. They subsequently organized under the title of The Textile Adjusters Association and a representative was elected to the Board of Governors.

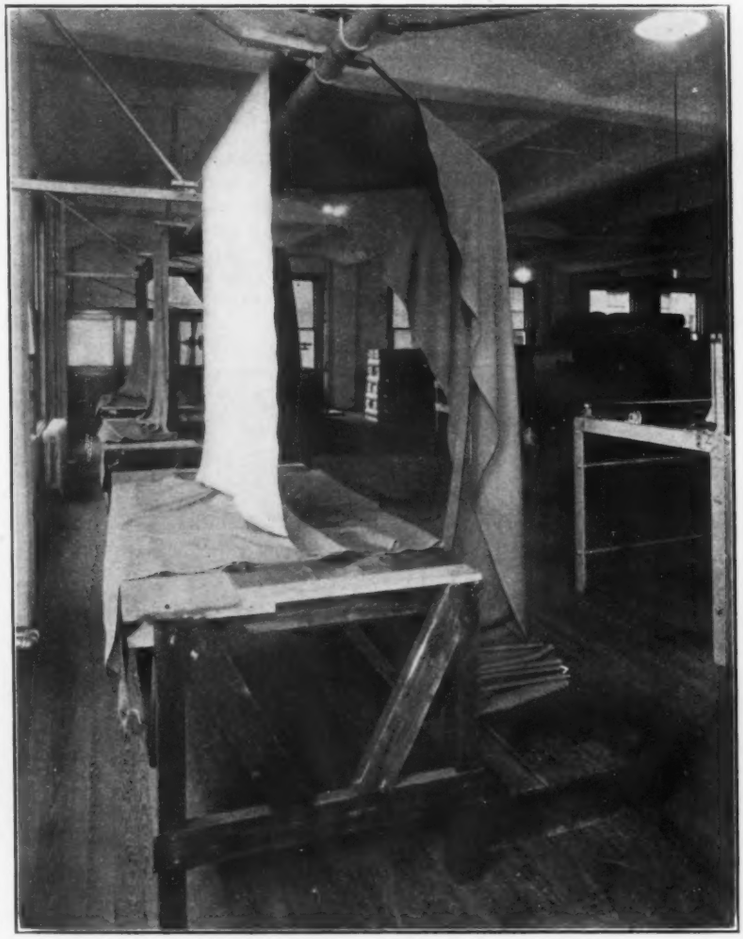
If it were necessary to do more than consider how completely the different branches of the industry are represented in the organization and control of the Bureau, in order to get assurance of the impartiality of its decisions, this further evidence would be found in the following record:

Of 1,070 cases submitted to the Mutual Adjustment Bureau of the Cloth and Garment Trades for decision, 365 were decided in favor of the buyer, 329 in favor of the seller and 376 were compromised, that is to say some of the pieces involved were returned to the mill and others were found to be a normal delivery.

Nothing could more eloquently testify to the utter impartiality of the Bureau's decisions than these figures. They indicate an obvious balance in favor of the buyer and put at rest the occasional comment that the Bureau is a sellers' organization. With three sellers on its Governing Board and eight buyers, one of whom is chairman, it is difficult to make out how it could be a sellers' organization.

It is not an exaggeration to say that during the five years the Bureau has been in existence, it has come to be recognized by buyers as well as sellers as an indispensable institution

Bolts of Cloth at Adjustment Bureau, Showing Tags for Imperfections Inserted by Inspectors.



Examining Rack in Adjustment Bureau Showing Unique Construction.

in the piece goods market. The advantage of having a permanent tribunal to which the inevitable disputes incident to daily commerce may be referred is obvious.

Divisions of the Bureau

Of necessity the disputes in the market are not sufficient in volume to furnish revenue adequate to operate the Bureau as it should be operated. It has therefore been necessary to divide the work of the Bureau into two departments — Judicial and Service.

In the Judicial Department only disputes are dealt with and in this department all examinations are made by the Managing Director.

In the Service Department goods are examined and graded and put into mill shape, or they are tested for strength or color. This work is of chief advantage in that it saves sending merchandise from New York back to the mills to be put into mill shape after it is returned by customers, involving loss of time and expense. This work is done by the Bureau, the goods are left there subject to call and a great convenience is the result.

The decisions of the Bureau have been recognized by the Court; the Bureau has on several occasions been subpoenaed to testify as experts and the promise is of continuously increasing and varied service to the market.

Character of Service

It is perhaps advisable to state here that only merchandise disputes are dealt with at the Bureau, it has no machinery for handling contractual disputes. The practice is increasing throughout the piece goods market of including in copies of orders a clause which reads as follows:

"ANY DISPUTE AS TO CONDITION OR QUALITY OF MERCHANDISE DELIVERED SHALL BE SETTLED BY THE MUTUAL ADJUSTMENT BUREAU OF THE CLOTH AND GARMENT TRADES, PURSUANT TO THE RULES AND REGULATIONS THEREOF."

This has the advantage of establishing at the beginning of a transaction the means and methods by which a dispute when it arises is to be dealt with.

Rules of Procedure

One of the aims of the Board was to avoid establishing dogmatic rules and regulations until the active daily operation of the Bureau should itself determine its needs. It was therefore not until a comparatively short while ago that a set of rules and regulations was formulated under which the Bureau proceeds. These follow:

Charges in the Judicial Department are 6c per yard on 5 pieces or less and 4c. per yard on 6 pieces or more.

Decisions of the Director are final, subject only to appeal to the Board of Governors. Such appeals proceed at a charge of twice the original charge, which is always paid by the party requesting the appeal regardless of the result.

The Bureau neither calls for nor delivers merchandise in dispute.

The Bureau requires that the party to a dispute shall execute a form which reads as follows:—

"We hereby signify our willingness to accept and abide by the decision of the Bureau in the dispute which we have with..... also to pay the charges in the event that decision is rendered against us.

(Signed) ....."

It is the aim of the Bureau and its Governors to have the piece goods and garment industries look upon the Mutual Adjustment Bureau as a service; to acquire the habit of consulting with the Director whenever a problem as to the condition of merchandise, its cause and results presents itself.

Ups and Downs of Wool Growing

Recovering Slowly After Setback—Stabilized Demand for Intermediate Grades is Needed

*By J. H. King**

IN reviewing the sheep industry of the West, as it pertains both to the raising of wool and breeding of sheep, to understand the chaotic condition the wool growers have passed through and are just emerging from, it is necessary to recall the conditions at the close of the war in 1918.

With the demand for ⅜ and ¼ blood wools during the war and the immediate falling off in this demand and the call for fine wool following in 1919-20, the wool grower and breeder were left in a quandary as to what course to pursue. This resulted in most cases in stocking up with fine wool rams, and discarding the long wool rams entirely. Some took an intermediate course, and used half-blood, such as the Corriedale, with the exception of such States as Idaho, where the mutton lamb is the first consideration and the call for Hampshires increased.

The Setback of 1921

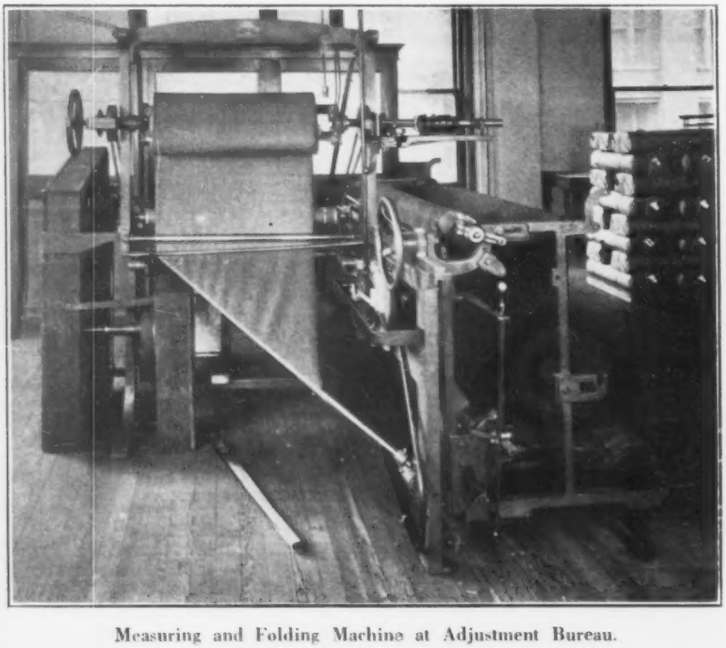
Under pressure of what followed, with deflation, government offerings of wool, tightening of banks, and call of loans where equity was eaten up, only those who have gone through the mill realize how close the sheep industry came to extermination. With the universal drought of the summer of 1920, throughout the Inter-Mountain States, with the most costly and ruinous feed bill of the winter following, perhaps the most costly the sheepman has ever faced, with hay, normally selling for $12 to $14 reaching from $35 to $45 per ton, with the late cold spring, and long drawn out feeding, with feed unprocurable at any price, the attendant losses both of ewes and lambs, started the sheep industry on a toboggan. It will take years of careful nursing to bring back both the numbers and the standard of breeding existing in 1919.

From 1920 to 1922 came further liquidation of flocks, through the forced marketing of both ewe and wether lambs. Old ewes which were almost unmarketable, were held back, and this resulted in falling off in quantity and quality of wool, and also greater losses in the winter. Fortunately, the broader vision of bankers and the operation or revival of the war finance loans encouraged sheepmen in 1923 to hold back their ewe lambs, which, with the addition of the purchase of better bred rams, will gradually tend to build the flocks up again.

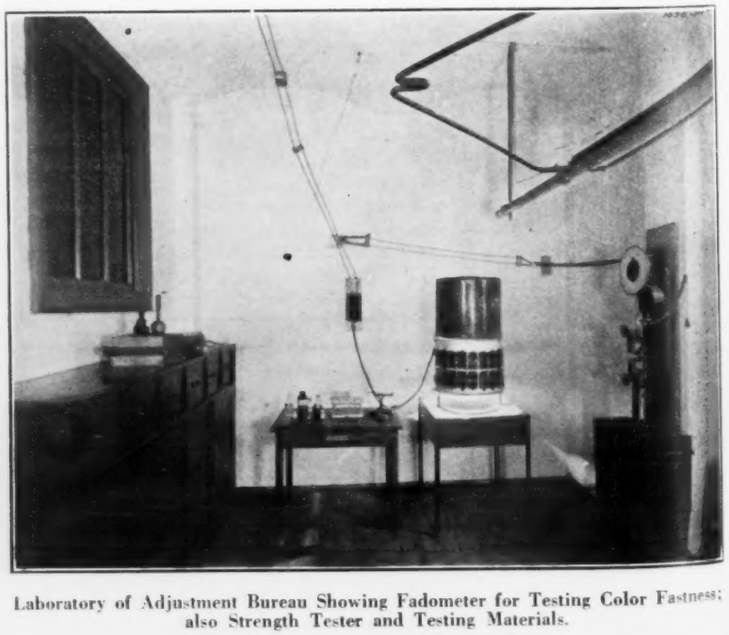
Orderly Market Needed

Our sheepmen are now faced with another changing condition. Fine wool last spring was still in the lead but with the revival of wool buying in the last two months the lower grades of ⅜ and ¼ blood are in greater demand. How the sheepman or breeder can be expecting to follow or keep up with these fluctuations is a mystery to us all. The industry cannot become stabilized until we get some kind of orderly marketing, not only of our sheep but of our wool. If the manufacturers could create a demand for medium wools, which are more economically raised on a type of sheep that is best adapted to the greater part of the range States, this would do more to stabilize the production of better merchantable wool, and also assist the breeders in attempting some systematic breeding.

* Of King Bros. Co., Laramie, Wyo., President of the American Rambouillet Sheep Breeders' Association.



Measuring and Folding Machine at Adjustment Bureau.



Laboratory of Adjustment Bureau Showing Fadometer for Testing Color Fastness; also Strength Tester and Testing Materials.

With demand calling, in greater part for wools grading from half to ⅝ blood wool, the fine wool breeds would be preserved, also the half-blood and long wool types so necessary in successful cross breeding. We have always advocated the half-blood type of range sheep, which can be best bred by using fine wool rams on medium or long wool ewes, or vice versa and by careful selection of the ewes at mating time. Those using fine wool rams on the coarse end, and good half-blood type rams, such as the Corriedale or long wool rams, on the fine clothing end, have noticed that by steering an intermediate course in breeding, using two types of rams on their range ewes, they are getting better returns for their lambs and a more even clip of wool.

"Jumbo," Champion Corriedale Ram, Chicago International, 1922, a dual-purpose sheep producing half-blood or high three-eighths. Called best form of fixed-type, half-blood sheep and popular on western ranges. Bred and ownd by King Bros. Co., Laramie, Wyo. This two-year old ram weighed 340 pounds and sheared 28 pounds of half-blood staple wool. Sired by "Senator Guthries," Grand Champion Ram at the Sydney Royal, Melbourne, Australia, and imported by King Bros.

"Majestic, Jr.," typical Rambouillet of the medium type popular in the West. Bred and owned by King Bros., Laramie, Wyo. Champion Rambouillet ram, Chicago International, 1920. Weighed 287 pounds and sheared 41 pounds of fine staple wool. Sired by "Old Majestic," Grand Champion Ram, San Francisco, 1914.

Texas and the Southwest went through a similar experience of drouth and costly high feed, which crippled them likewise in 1921-22, but they seem to be coming back faster than the Inter-Mountain States.

Cooperation Necessary

What the future holds for us depends upon continuation of the tariff, negotiation of long-time loans, decreased overhead, orderly marketing and systematic breeding.

If we can get the cooperation of the manufacturers in stabilizing demand for standard intermediate grades of wool and induce buyers and dealers to discriminate between well bred and well grown clips, it will be a boon both to breeders and enterprising flockmasters.

Gain Among Small Growers

The most recent statistics of the number of sheep on ranches in Wyoming are not available to the writer. In general it may be said that there has not been either a marked increase or decrease. No doubt the slight increase reported by the United States Department of Agriculture last year will continue at about the same rate this year. Doubtless the number of sheep held by large owners in some parts of the State is less than a year ago, but to offset this many of the smaller farmers and ranchmen are beginning to run a few sheep. The increase of the sheep industry in Wyoming must be expected to come largely through the increase of small owners.

The tendency will be to produce wool grading three-eighths or possibly half-blood. Hampshires and similar mutton breeds have not been found to be well adapted to most parts of Wyoming. The raising of the pure bred mutton sheep will be confined largely to irrigated farms. The crossbred sheep has been found to be the successful range sheep in Wyoming. Recent high prices on fine wools stimulated the growers to change to fine wool sheep. However, before the readjustment of prices between fine and medium wools came, the rangemen, in many cases, had found that the fine wool sheep were not efficient for the production of lambs on the range.

Corriedale a Favorite

The Corriedale is a true breed that has all the best qualities of the long wool and fine wool cross usually found on the range and it eliminates many of the troubles in connection with cross-breeding. For that reason it is becoming more popular as the years go by. Fine wool will not be likely to be grown in Wyoming except in a few isolated places and by breeders of purebred Rambouillet stock for crossbreeding, unless there is a very large price differential against the medium wools.

The sheepmen are fairly optimistic on the whole and feel that they can stay in business if present prices of wool and lambs continue. It is doubtful, however, whether the number of sheep will ever reach the high-water mark of the past for the reason tnat, with the closer settlement of the State, various kinds of diversified farming are being carried on in places which were formerly sheep ranges. Near the industrial centers dairy and poultry production is increasing. In the dry areas of the eastern part of the State, corn production is proving to be profitable. Where large areas are broken up for the production of corn, the farmers grow hogs for the purpose of turning the corn into meat.

Injury of Price Declines

Any marked decrease in the price of wool or lambs which would affect the inventory value of the breeding flocks, would most certainly cause a heavy reduction in the number of sheep in the State. Many outfits are still carrying on at the sufferance of the bankers, and any change which would make it appear that sheep are going to be unprofitable for a series of years, would bring about a forced liquidation. The amount of wool produced per sheep has probably fallen off in quantity as well as quality. The bankers have refused, in many cases, to allow the rangeman to buy rams of the same high quality that they have been using in the past. In many cases when it was necessary to raise cash to reduce loans, the sale of the very best breeding ewes was made instead of culling out the low quality and aged ones that should have gone under ordinary circumstances.

The grower feels that prices are going to be good during the coming year. He is very hopeful that no agitation in regard to the tariff will be allowed to overthrow the stability of the industry.

Entering Favorable Era

*By Charles Cheney**

I regret that I canot accept your proposition that the opinion of the majority makes the situation. I think the situation — that is, the business situation — is dependent, not upon opinions, but upon underlying facts and I think we make a great mistake and fall into a common error in assuming that business condition is the result of psychology. The reverse is the truth. Psychology is the result of business conditions. I therefore, do not feel that it is likely that any expression of opinion will materially affect the future. On the other hand, while I do not believe that opinions make the future I still believe that it is essential to have opinions for purposes of guidance.

My opinions are that we are entering a more favorable era and that we may look forward with a great deal of confidence to having 1924 a year in which business development will be fairly satisfactory. I make this, as I make all prophecy, with much reluctance and misgiving, for I know how dangerous the game of prophecy is. There are certainly many elements of uncertainty in the situation of the first magnitude and it would be very unsafe for anybody to neglect to keep close track of the situation and govern his course according to the indications as they may appear from week to week.

* Of Cheney Brothers, South Manchester, Conn.

Growth of Industry as Shown by 1921 Census

Expansion in Southern Production at Expense of New England's the Feature of Cotton Figuers—Wool Manufactures Less Than 1919 and 1914—Silks and Knit Goods Less than 1919 But Well Above 1914—Marked Increase in Knit Fabrics and Fancy Knit Goods

By *Henry T. Siebert**

THE year 1921 in the textile industry was sub-normal both as to volume and value of production, and marked the slow beginning of the recovery from the disastrous slump that started in the spring of 1920. It was to be expected, therefore, that the census of its manufactures for 1921 would disclose a marked shrinkage in the value of production and a considerable decrease in its volume; that the latter is not the case in a few important instances is proof of the basic soundness of the industry and of its power to recover quickly from temporary depressive influences.

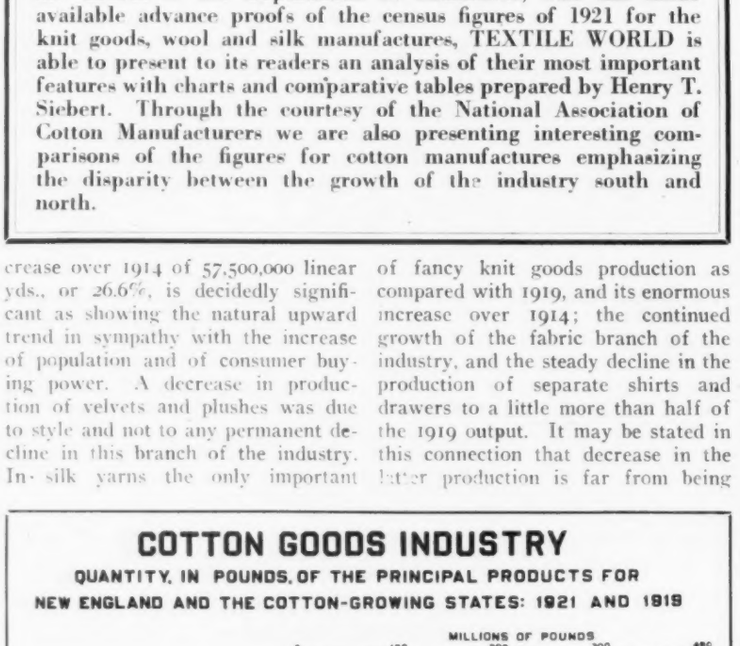
While production of cotton sale yarns in 1921 was 133,000,000 pounds less than in 1919, or a decrease of a little over 20%, the production of cotton goods in pounds was almost identical with that of 1919, while the production figured in square yards actually increased a little over 5%. The most notable feature in this connection, however, is the fact that the sale yarn production of mills in the New England states in 1921 was almost 50% less than in 1919, while that of mills in the southern states decreased only 11,200,000 pounds, or a little over 3%. In cloth production New England mills barely held their own as compared with 1919, while mills in the cotton states increased their production 407,300,000 sq. yds., or a little over 12%.

Production of wool manufactures in 1921 was approximately 5% less than for the census year 1919, and over 9% less than that of the census year 1914. Although style favored carded woolen fabrics, in 1921, as has been the case since then, the shrinkage in production of such goods was greater than that in worsted fabrics, the former showing a decrease of 13% and the latter of less than 3%. Production of carded woolen sale yarns was 7,130,000 pounds less than in 1919, whereas production of worsted sale yarns increased 13,350,000 pounds; it is of interest in this connection to know that production of worsted yarns in 1921 was almost identical with that of 1914 whereas the decrease in carded woolen sale yarn production was almost the same as that from the census year of 1919. That cotton blankets continue to cut into the sale of wool blankets is proved by a shrinkage of 5,000,000 yds. as compared with 1919, and of 8,000,000 sq. yds. as compared with 1914. Production of carpets and rugs showed a slight improvement in 1921 as compared with 1919, the increase being entirely in rugs, but compared with 1914 production there is a decrease of more than 12,000,000 sq. yds.

A decrease of 11.8% in the yardage of broad silks manufactured in 1921, as compared with production of the same in 1919 is of no special significance in view of the depression of the former year. The marked increase over 1914 of 57,500,000 linear yds., or 26.6%, is decidedly significant as showing the natural upward trend in sympathy with the increase of population and of consumer buying power. A decrease in production of velvets and plushes was due to style and not to any permanent decline in this branch of the industry. In silk yarns the only important change was a substantial increase in tram production and the continued steady growth of the spun silk branch of the industry.

The outstanding features of the knit goods census are the very marked increase in quantity and value of fancy knit goods production as compared with 1919, and its enormous increase over 1914; the continued growth of the fabric branch of the industry, and the steady decline in the production of separate shirts and drawers to a little more than half of the 1919 output. It may be stated in this connection that decrease in the latter production is far from being made good by the moderate increase in production of union suits, thus reflecting the competition of fabric underwear. The decrease in hosiery production as compared with 1919 is just about equal to the increase over 1914, and reflects the normal growth of this branch of the industry.

Through the courtesy of W. M. Steuart, director Bureau of the Census of the Department of Commerce, who has made available advance proofs of the census figures of 1921 for the knit goods, wool and silk manufactures, TEXTILE WORLD is able to present to its readers an analysis of their most important features with charts and comparative tables prepared by Henry T. Siebert. Through the courtesy of the National Association of Cotton Manufacturers we are also presenting interesting comparisons of the figures for cotton manufactures emphasizing the disparity between the growth of the industry south and north.



Cotton Manufactures

The fact that the cost of production in New England's cotton industry is higher generally than in other great manufacturing centers of the country has forced New England to market the products of its greatest industry by appealing to the consumer on a quality, design, or specialty basis. This is illustrated very vividly by the accompanying charts and tables, prepared from Bureau of the Census figures. The chart showing quantity produced bears out the assertion by showing that of the major products of the industry only in (1) ginghams; (2) lawns, nainsooks, cambrics, and similar muslins; (3) twills and sateens; and (4) tire fabrics, other than duck, is New England still able to lead.

Production of woven cotton goods over 12 in. in width showed an increase from 1919 to 1921 on a square yardage basis from 6,317,000,000 sq. yds. to 6,724,000,000 yds., but from the poundage standpoint fell from 1,815,000,000 lbs. in 1919 to 1,742,000,000 in 1921. As may be inferred, there was a very marked tendency from 1919 to 1921 to weave cloth from higher count yarns. For all woven goods over 12 in. in width, which classification represents from 70 to 75% of the value of all products produced in the cotton goods industry. The average number of sq. yds. per lb. of cloth ranged as follows:

	1921 sq. yds. per lb.	1919 sq. yds. per lb.	Percentage increase
United States	3.86	3.48	10.9
New England	4.61	3.85	19.7
Cotton-growing States	3.57	3.24	10.2

It will be observed that the trend was more pronounced in the cotton mills of New England than in those of the cotton-growing states.

Production of woven goods over 12 in. in width did not increase as much in New England from 1919 to 1921 as in the cotton-growing states, the increase for the former being only 4,500,000 sq. yds., compared with 407,000,000 for the latter. How much of this disparity of gain can be attributed to intermittent operation of New England mills resulting from higher costs of production cannot be stated here, but the fact remains that the cotton-growing states in times of depression (the year 1921) are in a

*Statistician National Association of Cotton Manufacturers.

most favorable position in regard to quantity produced and price received per unit. The average drop in price between 1919 and 1921 in cents per pound for all woven goods over 12 in. in width produced was 27.2c. for the whole country, 27.4c. for New England, and only 25.0c. for the cotton-growing states. The average price drop must be qualified by bearing in mind that generally speaking staple goods do not decline in price to so great an extent as higher priced fabrics.

Wool Manufactures

There was a general decline in the value of products produced in the wool manufacturing industry from $1,234,657,000 in 1919 to $885,558,000 in 1921, the latter figure, however, being almost twice $464,250,000, the value in 1914 according to Bureau of the Census figures just issued.

The aggregate output of woven goods in the two leading industries, woolen-goods and worsted-goods, which represent about five-eighths of the total value of products for the wool manufacturing industry, declined from 1914 to 1919, and from 1919 to 1921, the decrease during the latter period being approximately 8% when measured in square yards and more than 18% when measured in pounds. Approximately 234 million square yards were manufactured in the woolen-goods branch in 1921 compared with 246 million yards in 1914. In the worsted-goods end the decline was from 319 million square yards in 1914 to 260 million in 1921. It is interesting to note, as may be seen from the charts, that production of all-wool suitings, dress goods, overcoatings, and cloakings, which constitute over 63% of all woven goods produced in the woolen-goods and worsted-goods branches, rose in the former branch from 91 million square yards in 1914 to 132 million in 1921, whereas in the worsted industry a loss in output from 222 million to 185 million was incurred over the same period. Production of blankets fell off from 28 million square yards in 1914 to 25 million in 1919, to 20 million in 1921; and domet flannels and shirtings, after rising from 16 to 22 million square yards from 1914 to 1919, suffered a loss in popularity in 1921 so that only 4½ million yards were produced. All-wool and cotton mixed flannels for underwear also suffered from the 1921 depression which affected the wool manufacturing industry, as only 4½ million square yards were produced in that year compared with 8 and 7 million in 1919 and 1914.

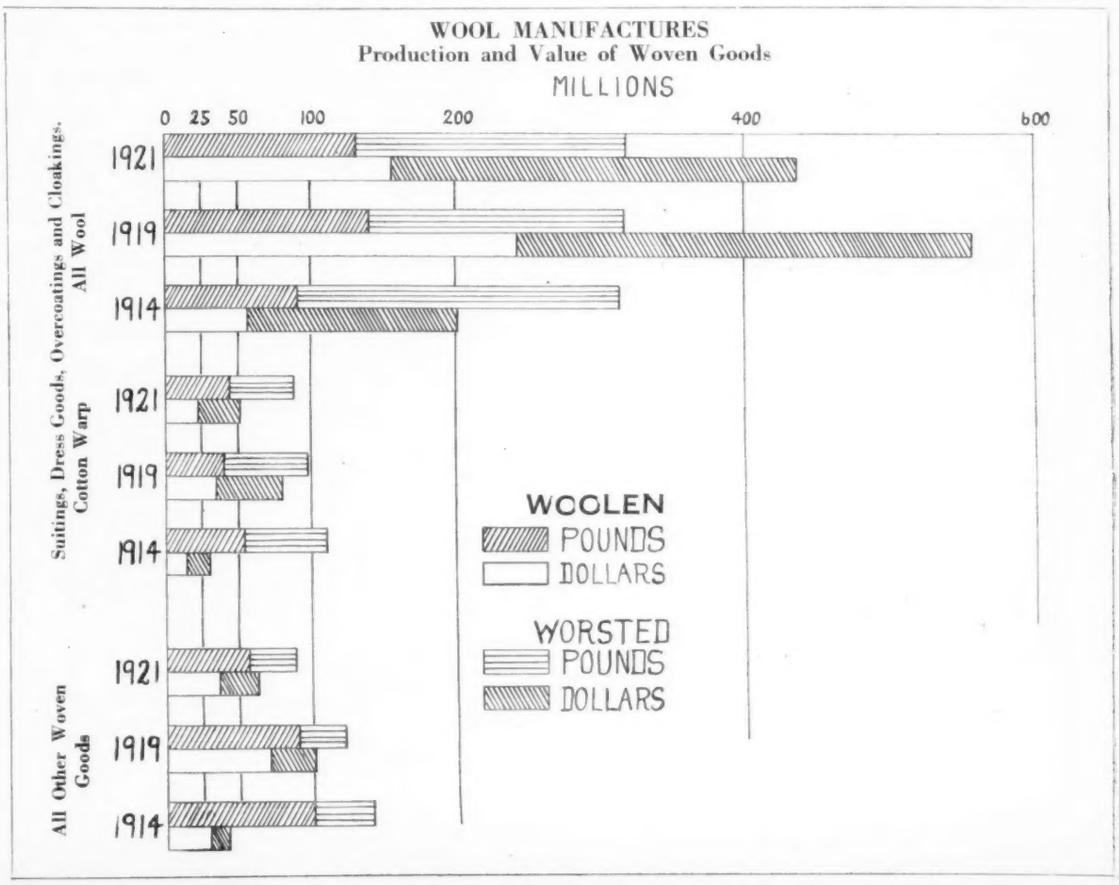
In the yarn end of the industry we find all-wool carded-wool yarns are being produced in increasing quantities, the figures showing 26 million pounds in 1914, 28 1/3 million in 1919, and nearly 31 million two years later. All-wool worsted yarns also showed a surprising gain in 1921 of 11½ million pounds over 1919, but still half a million pounds under the production seven years previously, when production was 85½ million pounds. Merino carded wool yarn output in 1921 was only about one-sixth of the 1919 production of 9½ million pounds, and was the outstanding decline in yarns. As would be expected from a rise in worsted yarn production, an increase of 450 thousand pounds, or about 5%, in tops and slubbing was registered in 1921 over 1919.

In the carpet and rug industry only rugs, woven whole, showed anywhere near normal production in 1921, the

Cotton Piece Goods Production 1921, 1919

	1921			1919		
Woven goods (over 12" in width):	Pounds	Square Yards	Value	Pounds	Square Yards	Value
United States	1,741,591,232	6,723,656,963	956,731,860	1,814,949,042	6,317,397,984	1,489,610,779
New England	627,743,501	2,829,541,243	444,435,688	715,564,501	2,824,924,188	703,159,102
Cotton-growing States	1,015,878,356	3,620,559,108	422,341,753	980,926,071	3,213,197,498	652,139,729
Sheetings—						
United States	381,352,105	1,600,998,979	158,216,314	330,303,642	1,368,946,386	220,069,704
New England	84,529,242	352,571,097	45,870,433	67,521,470	271,009,722	62,966,997
Cotton-growing States	281,622,684	1,195,289,693	103,793,846	250,807,263	1,047,305,819	157,789,101
Duck—						
United States	152,901,873	186,922,903	92,681,321	288,530,650	336,500,457	287,082,551
New England	35,595,729	38,037,703	33,780,980	97,624,410	101,339,387	101,621,950
Cotton-growing States	100,713,378	135,642,803	46,178,314	146,781,310	194,771,652	90,449,428
Ginghams—						
United States	111,586,693	536,608,503	87,983,968	77,396,286	368,307,601	85,070,745
New England	61,442,724	298,056,988	53,242,991	42,250,587	190,509,328	51,373,664
Cotton-growing States	47,916,406	225,526,731	29,944,348	34,069,043	173,604,126	32,565,674
Print cloth—						
United States	201,708,640	1,157,680,495	82,038,617	167,986,446	997,485,012	122,558,328
New England	68,975,471	435,171,338	27,994,423	60,873,955	407,632,634	46,324,218
Cotton-growing States	129,363,031	702,997,251	52,671,984	*99,236,961	*544,752,370	*70,692,330
Lawns, nainsooks, cambrics, and similar muslins—						
United States	53,815,618	392,203,289	58,408,313	53,988,370	417,893,406	79,384,890
New England	39,015,127	313,824,113	50,501,560	†45,915,760	†361,875,165	†70,318,534
Cotton-growing States	14,774,191	78,278,961	7,805,712	6,836,820	43,966,463	7,084,786
Twills, sateens, etc.—						
United States	111,077,877	384,635,533	51,834,924	131,537,280	424,478,033	101,056,691
New England	61,097,661	234,427,583	33,453,605	*81,668,527	*289,461,382	*66,724,057
Cotton-growing States	40,236,000	109,560,311	13,993,289	40,732,610	98,537,679	27,338,840
Shirtings—						
United States	69,031,872	300,719,901	51,711,864	79,590,092	352,129,632	83,348,867
New England	33,683,993	167,788,786	32,444,761	32,244,108	166,767,721	42,804,338
Cotton-growing States	34,991,527	130,523,220	17,749,526	46,329,127	180,507,323	36,258,662
Tire fabrics, other than duck—						
United States	40,190,848	43,933,691	43,913,959	29,916,856	36,805,932	32,601,941
New England	26,434,303	28,531,450	29,949,930	26,956,199	33,332,040	29,232,022
Cotton-growing States	8,360,809	9,886,572	6,745,521	2,200,871	2,668,519	2,406,077
Cotton flannel (canton flannel, flannelettes, and blanketings)—						
United States	87,635,635	294,717,750	37,690,967	82,319,178	288,067,853	60,153,424
New England	43,468,847	149,465,609	19,833,472	†40,327,764	†138,232,922	†30,767,175
Cotton-growing States	44,166,788	145,252,141	17,867,495	39,951,968	124,444,886	27,496,411
Denims—						
United States	89,757,975	168,126,957	30,677,266	87,088,323	166,697,695	56,955,502
New England	16,864,155	30,568,673	6,873,414	24,574,345	43,217,731	16,807,040
Cotton-growing States	72,884,820	137,545,584	23,794,052	62,513,978	123,479,964	40,148,462
Drills—						
United States	70,999,578	191,715,280	22,031,291	117,627,118	314,822,109	73,253,640
New England	7,754,713	19,084,862	2,098,695	16,353,279	46,167,301	11,141,323
Cotton-growing States	61,765,729	167,180,948	19,509,563	100,863,000	267,415,815	61,181,621
Yarns for sale—						
United States	484,218,907	.....	218,555,043	618,034,098	.....	453,624,493
New England	104,393,496	.....	77,742,325	208,964,623	.....	191,466,771
Cotton-growing States	347,875,291	.....	128,267,472	359,003,634	.....	228,991,462

*Excludes statistics for one establishment to avoid disclosing its operations.
†Excludes statistics for two establishments to avoid disclosing their operations.

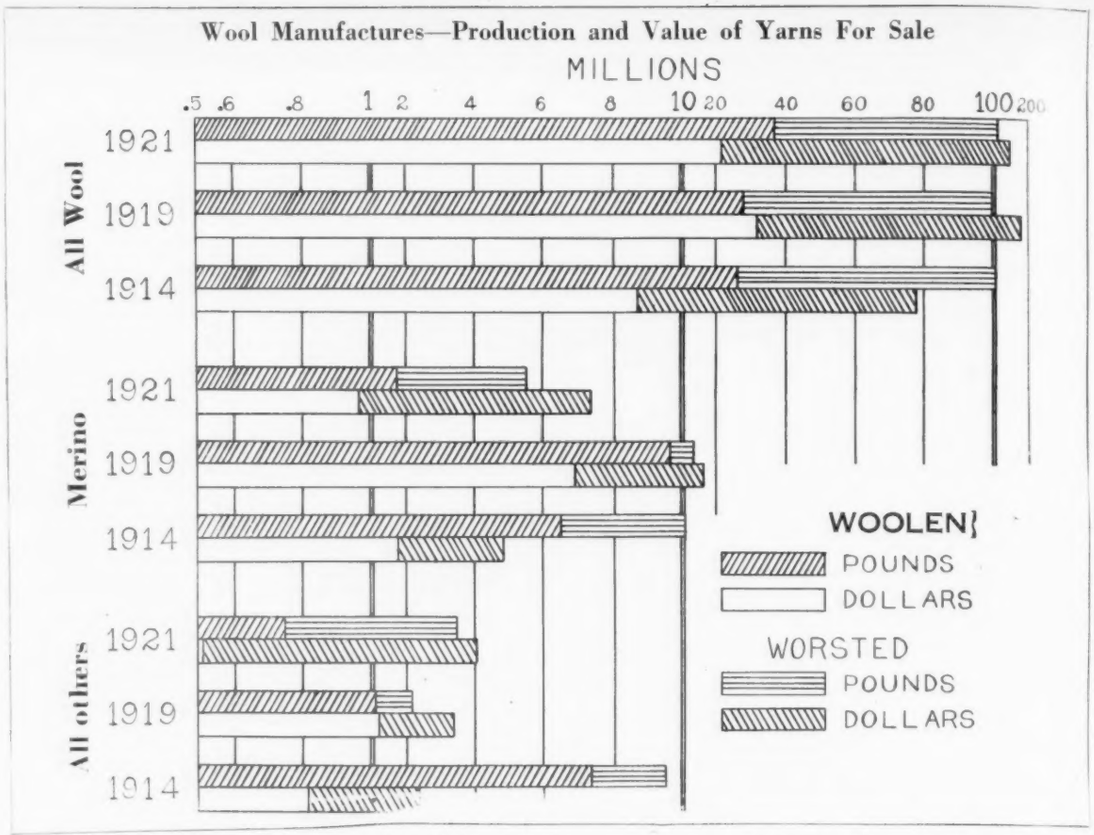


output of this class in that year being 28¾ million yards against 28 million in 1914. Increased production was attained in axminster and moquette woven whole rugs which are coming into use more and more, production in 1921 being nearly 8 million square yards, a gain of 2,200,000 yards over 1914. Woven whole Wiltons and tapestry Brussels were also more popular in 1921 than in the pre-war year, while rugs made of wool and paper fibre showed a serious decline from 6,800,000 square yards in 1919 to 1½ million in 1921. Carpet production in 1921, although 13 million sq. yds., 1 million more than in 1919, was over 4 million below 1914 output. Ingrain carpets were especially hard hit, production falling from 5,800,000 sq. yds. in 1914 to 800,000 in 1921. Brussels carpets made a small gain of 300,000 yards over the seven year period, but all other kinds showed decreases. Every class of rugs made of sewed strips with the exception of axminster and moquette showed a continuous production drop from 1914 to 1921. Axminster and moquette gained 2 million yards from 1919 to 1921, but lost 300,000 yards from the year 1914 to 1921.

Production and Value 1921, 1919, 1914

		Carpets and Rugs Sq. Yds.	Value
Carpets	1921	13,057,285	$20,302,500
Carpets	1919	11,966,209	25,569,092
Carpets	1914	17,211,247	15,186,790
Rugs made of sewed strips	1921	12,070,465	25,361,125
Rugs made of sewed strips	1919	12,472,380	34,588,982
Rugs made of sewed strips	1914	20,854,526	25,945,708
Rugs, woven whole	1921	27,777,812	53,602,611
Rugs, woven whole	1919	27,734,502	51,957,902
Rugs, woven whole	1914	28,174,401	23,550,824
All other products	1921	.....	2,842,964
All other products	1919	.....	13,137,856
All other products	1914	.....	4,444,863

The industrial depression of 1921 also had a pronounced effect on the wool-shoddy industry, which consists in the recovery of wool fibre from rags, clippings, yarns, and waste. The average number of wage earners decreased over 54 per cent or from 2,506 to 1,170 between 1919 and 1921, and was little more than half as large in the latter year as in 1914. The total quantity of recovered wool fibre reported in 1921 as 27,314,147 pounds, was less than half as large as 59 million pounds in 1919 and only 63 per cent as large as the 1914 total. The value of products in 1921, $6,800,000, showed a still more pronounced decrease compared with 1919 (almost 71 per cent) and was $900,000 below the 1914 figure. The value of products, however, in this or other branches of the wool manufactures industry, does not afford a reliable measure of the growth or decline of the industry, because of the strongly marked price changes which have taken place in recent years.



Silk Manufactures

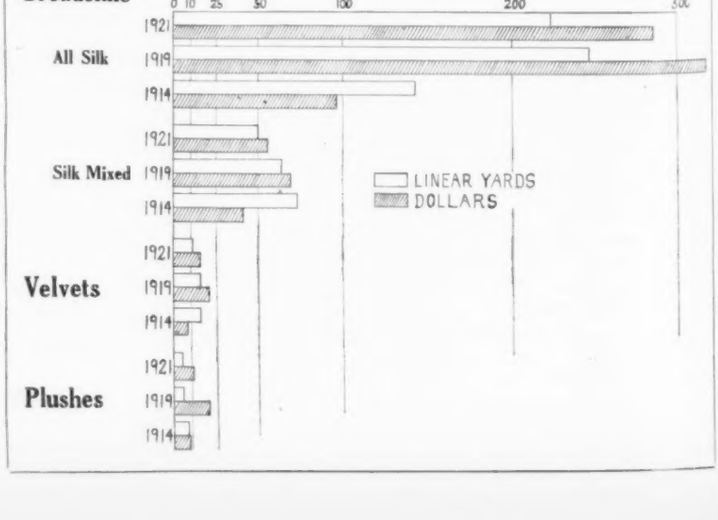
The value of products of the silk manufactures industry in 1921, $583,418,736, although 15.3% below the 1919 total of $668,469,523, was more than twice as large as in 1914 when the figure was $254,011,257 but because of the pronounced price changes which took place between the years mentioned does not offer a true comparison. A better standard of measure is shown by the quantities of the various products manufactured as reported to the Bureau of the Census. All the principal classes of fabrics, as may be seen from the tables and the fabric chart, showed decreases from 1919 to 1921. Broad silks production fell off from 310 million linear yards to 274 million, a decline of 11.8%. Velvets lost over 4½ million yards or 29%, production in 1921 being only 11½ million linear yards. Plushes also lost, but only slightly. It is interesting to note that production in linear yards of silk-mixed broad silks, velvets, and plushes, decreased from 1914 to 1919 and from 1919 to 1921. Upholstery and tapestry, however, is being produced in increased quantities, output in 1914 being 478,000 linear yards; in 1919, 516,000; and in 1921, 974,000 yards. All-silk broad silks show an increased output in 1921 over 1914 the last preceding normal year of approximately 56%. With regard to taking the average price per linear yard as a measure of the extent to which price changes have taken place, the Bureau of the Census makes the following comments:

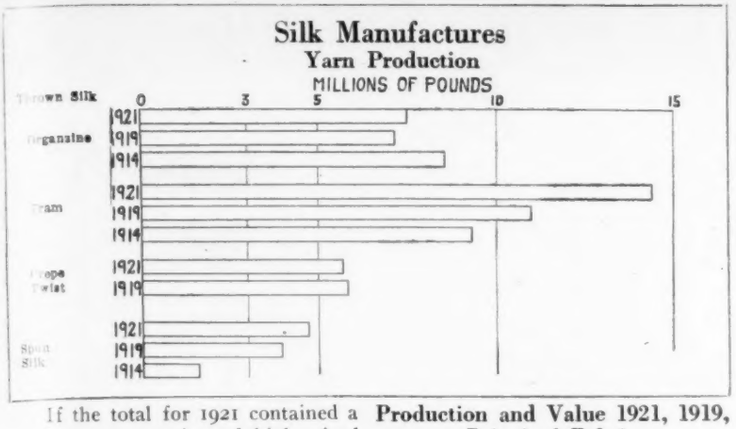
> "The rate of decrease in the total value of broad silk—by far the most important group of products—between 1919 and 1921, 12.9%, was only a little higher than the rate of decrease in quantity measured in linear yards, 11.8%; in other words, there was only a slight decrease in the average price per linear yard for all broad silks combined. This average, however, is influenced not only by price changes but by variations in the proportions of high-priced and low-priced goods. To illustrate:

Production and Value

Suitings, Dress Goods, Overcoatings and Cloakings—	Woven Goods: Woolen Goods Sq. Yds.	Woolen Goods Value	Worsted Goods Sq. Yds.	Worsted Goods Value
All-wool—1921	132,286,019	$156,551,258	185,358,745	$279,912,705
1919	139,410,362	243,072,041	176,506,452	313,679,634
1914	90,950,381	55,660,503	222,420,786	141,778,035
Cotton warp—1921	44,363,298	22,664,815	43,151,073	27,780,694
1919	39,146,902	34,735,320	57,896,787	45,342,581
1914	53,569,462	13,598,607	56,762,691	15,563,099
All other woven goods—1921	67,076,484	37,167,356	31,523,934	26,613,863
1919	91,048,688	71,400,115	31,928,391	31,050,104
1914	101,556,656	29,462,783	40,261,784	12,676,043

	Yarns for Sale: Carded Woolen Pounds	Carded Woolen Value	Worsted Pounds	Worsted Value
All-wool—1921	30,734,093	$22,877,337	85,860,513	$126,287,112
1919	28,378,039	32,528,532	74,336,549	185,124,293
1914	26,125,575	8,783,020	86,412,097	69,801,271
Merino—1921	1,578,249	961,809	3,921,451	6,387,595
1919	9,658,894	6,922,886	3,709,056	9,214,421
1914	6,473,849	1,689,530	4,048,514	3,173,034
All other—1921	749,260	501,324	2,772,887	4,064,942
1919	1,086,003	1,100,984	1,132,382	2,343,345
1914	7,378,846	820,535	2,121,180	1,604,825





If the total for 1921 contained a larger proportion of high-priced classes of goods than the total for 1919, this change would tend to raise the average price per linear yard and would offset in some degree the effect of the reductions in prices."

Over the seven year period from 1914 to 1921 silk yarn production, in general, tended in the opposite direction from silk fabrics, increasing instead of decreasing. In the manufacture of silk yarn in the United States over 75% of the silk thrown is done on commission, and since no value of the separate classes, organzine, etc., of raw silk thrown on contract is reported to the Bureau of the Census, no values for the whole industry can be given here. Silk not thrown on commission in the three census years amounted to 6,400,000 lbs., valued at $47,000,000 in 1921 to 5,600,000 lbs., valued at $53,000,000 in 1919, and to 1,200,000 lbs., valued at $5,000,000 in 1914. Output of spun silk showed the greatest proportionate gain from 1914 to 1921 of any class of yarn produced rising from 1,600,000 lbs., in the former year to 4,700,000 in 1921.

Production and Value 1921, 1919, *Principal Fabrics*

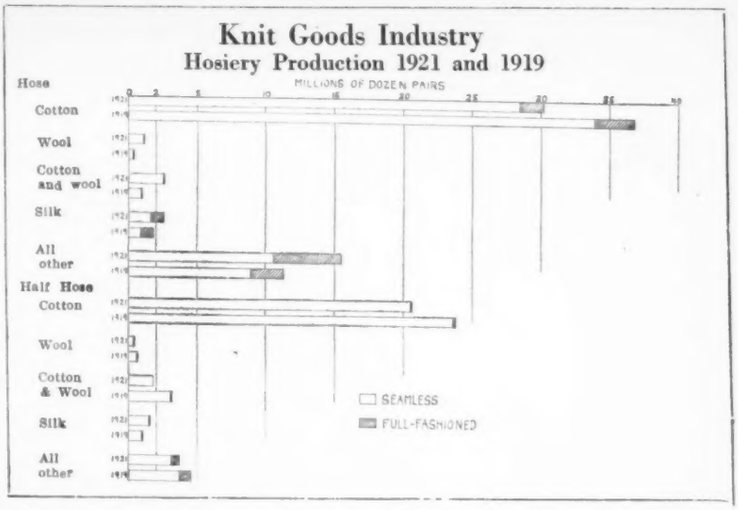
		Linear yards	Value
Broad silks—			
All-silk	1921	223,298,049	$284,760,628
All-silk	1919	245,860,918	322,503,746
All-silk	1914	142,713,359	96,689,801
Silk-mixed	1921	50,286,339	56,296,129
Silk-mixed	1919	64,271,142	69,233,137
Silk-mixed	1914	73,320,337	41,029,763
Velvets	1921	11,477,143	16,000,111
Velvets	1919	16,150,689	20,950,229
Velvets	1914	16,318,135	8,570,022
Plushes	1921	5,580,386	12,126,446
Plushes	1919	5,860,527	21,601,280
Plushes	1914	9,114,992	10,135,842

Yarns

		Pounds
Thrown silk—		
Organzine	1921	7,500,672
Organzine	1919	7,172,742
Organzine	1914	8,681,228
Tram	1921	14,405,165
Tram	1919	11,006,773
Tram	1914	9,358,412
Crepe twist	1921	5,723,386
Crepe twist	1919	5,865,959
Crepe twist	1914	.....
Spun silk	1921	4,737,137
Spun silk	1919	3,956,637
Spun silk	1914	1,607,416

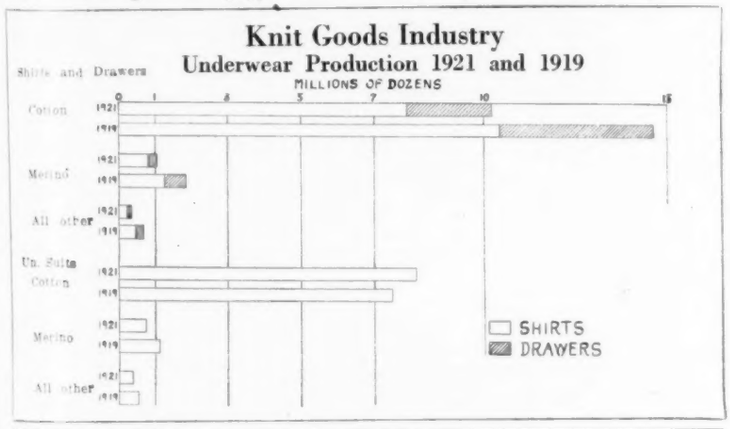
The Knit-Goods Industry

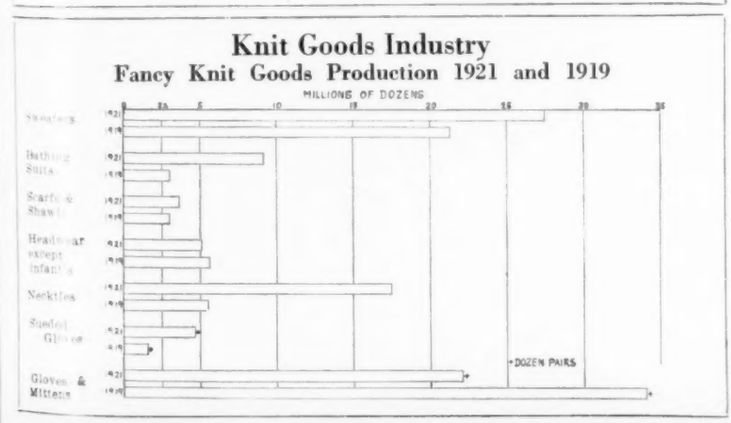
The knit-goods industry was not affected by the industrial depression of 1921 to as great an extent as most other divisions of the textile industry. Pennsylvania and New York contributed about equally 55% of the total value, $634,073,895, produced by the industry in that year. A brief table can be given summarizing the conditions found in the last three census years, which shows 1921 hosiery production over 1914 but under 1919; output of shirts and drawers steadily downward since 1914; and union suits with the opposite trend:



Product	1921	1919	1914
Total value	$634,073,895	$713,139,689	$358,912,903
Hosiery:			
Dozen pairs	80,240,936	84,645,757	75,184,911
Value	$290,488,560	$308,662,377	$88,098,590
Underwear, value	$134,864,534	$203,530,283	$93,119,086
Shirts and drawers:			
Dozens	11,711,624	17,180,404	21,758,775
Value	$49,875,620	$98,286,403	$57,523,051
Union Suits:			
Dozens	9,283,748	9,211,032	6,272,515
Value	$84,988,914	$105,243,880	$35,696,034
Fancy knit-goods, value	$137,005,437	$111,705,313	$46,177,864
Knit cloth, value	$45,299,113	$59,347,745	†

† No comparable data.





Knit Goods Production

A Comparison of Quantities and Values

Hosiery—Product	1921		1919	
Hose	Dozen pairs	Value	Dozen pairs	Value
All-cotton—Seamless	28,520,902	$58,055,863	33,894,961	$94,751,286
Total	30,235,746	62,631,109	36,835,602	105,647,876
All-wool—Seamless	1,098,044	6,941,920	368,294	1,920,766
Total	1,124,074	7,190,864	395,268	2,139,960
Cotton and wool mixed—Seamless	2,599,768	9,980,685	997,975	4,203,563
Total	2,631,919	10,290,633	1,029,371	4,456,430
All natural silk—Seamless	1,617,335	16,621,538	913,091	9,208,726
Total	2,590,588	35,825,155	1,848,554	21,599,428
All other—Seamless	10,654,618	48,522,106	8,927,085	50,109,040
Total	15,498,253	113,249,562	11,316,546	82,807,674
Half-hose—				
All-cotton—Seamless	20,560,256	31,469,849	23,578,663	47,208,986
Total	20,858,350	31,624,566	23,777,740	47,849,610
All-wool—Seamless	374,606	1,593,934	612,729	2,995,951
Total	389,644	1,685,642	651,782	3,256,910
Cotton and wool mixed—Seamless	1,835,203	6,130,050	3,115,001	10,315,965
Total	.....	.....	3,164,007	10,541,696
All natural silk—Seamless	1,494,684	8,062,557	996,409	5,800,856
Total	1,540,392	8,385,956	1,080,825	6,851,906
All other—Seamless	3,120,957	10,090,538	3,674,808	15,608,164
Total	3,736,767	13,475,224	4,546,063	23,510,887
Underwear—				
Shirts and drawers	Dozens	Value	Dozens	Value
Cotton—Shirts	7,917,197	$23,568,210	10,428,506	$46,889,941
Total	10,282,605	34,992,932	14,655,963	72,564,632
Merino—Shirts	778,327	5,851,638	1,260,829	11,907,688
Total	1,077,229	9,295,513	1,848,863	19,621,964
All other—Shirts	222,122	3,333,914	460,772	3,944,828
Total	351,790	5,587,175	675,578	6,099,806
Union Suits—				
Cotton	8,153,389	59,516,151	7,518,516	71,122,386
Merino	755,083	14,856,944	1,133,750	21,415,647
All other	374,776	10,615,919	658,786	12,705,847
Fancy Knit Goods—				
Sweaters, sweater coats, jerseys, cardigan jackets, etc	2,747,644	69,426,457	2,132,581	61,094,341
Bathing suits	909,375	11,202,241	301,393	6,644,906
Scarfs and shawls	262,677	7,784,658	298,237	4,054,859
Headwear (except infants)	507,993	3,408,674	567,733	3,996,398
Neckties	1,756,633	9,136,740	547,631	5,100,947
	Dozen pairs		Dozen pairs	
Sueded cotton gloves	469,404	3,900,274	163,086	1,061,856
Gloves and mittens (except sueded)	2,215,767	21,308,752	3,408,037	18,468,555
All other	.....	10,837,641	.....	11,283,451
Knit Cloth	Sq. Yards	Value	Sq. Yards	Value
Jersey cloth	29,910,821	$25,983,171	20,291,067	$24,965,718
Tricolette	8,200,695	9,430,173	5,061,639	17,172,431
All other	.....	9,885,769	.....	17,209,596
Total	.....	$634,073,895	.....	$713,139,689

Processing of Short Foreign Cottons

Modern Practice in the Preparation and Spinning of the Shorter Cottons, Both American and Foreign, and Also Wastes—Their Proper Handling and the Machinery Utilized—Possibility and Need of Spinning Such Cotton to Finer Counts Than at Present

By *James Winterbottom, M. Sc. (Tech.)**

THE object, in this article, is to endeavor to explain the possibilities of substituting other cottons for short cottons of American growth.

The question of the substitution of outside growths of cotton for the shorter American upland cottons is a very old one which has been interred and disinterred repeatedly within the memories of even not very old men. This repetition has occurred with the presence of short and abundant supplies, respectively, of American cotton. For some time it has been looming from a shadow into life until, at the moment, it may be said to have become one of the most prominent questions in cotton spinning circles. Whatever may be the position in regard to written records of the advantages and disadvantages of using outside growths, the question has been answered in practice, and the answer is undoubtedly represented by the way in which those responsible for raising the outside growths have responded to their interests. The inspection of the annual crop returns of the past would suggest, if the amount grown is any criterion, that the growers have only been satisfied with the spinner's response for a short period. If this is so, there exists once more the opportunity of reaching a mutual understanding, as no grower could find good grounds for complaint in the prices now being paid for all kinds of cotton.

Again the question of substitution of American cotton, in any measure, has become a matter of the most vital importance to the world's cotton industry, on account of the recent short crops and the consensus of opinion of those most competent to speak on the matter. These authorities agree that the shortage may prove not a temporary phase, as the unfortunate position has been so gradual in its development, and on each occasion of recent shortages the deficiency has increased in magnitude and become of a more protracted nature. The causes of the bad position have, moreover, gradually changed from simple matters to a series of very complex problems out of which there are not wanting those indications suggestive of a succession of seasons during which American is likely to be short in supply. It is therefore of unusual interest to the trade to consider all measures for relieving the harassing circumstances.

Buyers Must Be Considered

A further thought which arises in considering the treatment of this subject is that one must not get away from the point as it affects the users. Although it may be of some service to discuss matters of interest to the potential user, the present bulk interest and the necessities of the moment must have first consideration, and hence the point of view herein taken will be how spinners may use other cottons than those which they have been accustomed to use for the production of the same counts and qualities of yarn in which they are specialized and established with a firm and good business.

To discuss in detail, for instance, the most appropriate kinds of yarn for which the available outside growths are best adapted, would present a view point of less interest and lead to a field which is too wide and outside the scope of the present article. The greatest interest will probably be best served in directing attention to those things which are most material in the matter of how the available outside growths may be used in substitution for other growths. Also, the circumstances under which this can be done advantageously in the long run and without affecting the present product in a manner which would diminish the appreciation of those for whom the goods are made. This is a difficult proposition and is only possible on relatively general lines covering a limited field. For this reason alone a warning note is desirable, and that is that it may be advisable whenever there is any element of doubt, to endeavour to switch the buyer off the ordinary yarn by presenting the new product suitably and as one which may be of some interest. It may often be found that the substitute, even when more attractive for the purpose than the one ordinarily used, is regarded with a varying amount of suspicion. Hence, such must be presented in various ways and always in accordance with the merits of each particular case.

It is remarkable that although our immediate past experiences of scarcity of all kinds of commercial and domestic supplies, have accustomed all bodies to the making of the best use of things, by some sort of control, yet direction towards dilution or prohibition, with the object of eliminating waste, etc., has not reached the war and immediate post-war attitude.

Short foreign cottons have been used in this country only in small quantities, and these rough East Indian and Chinese cottons almost exclusively for blankets.

Continued world scarcity and high prices of cotton are causing domestic spinners to investigate the possibilities of utilizing short foreign cottons for their coarser counts, and to meet their requests for information regarding the correct method of processing these cottons the editors have prevailed upon James Winterbottom, an English authority on the subject, and the author of several textile books, to prepare a series of articles, the first of which appears in this issue. A later series will cover the selection and blending of foreign short cottons.

In this matter of cotton, the recent suggestions for relieving the difficulty and the lack of any evidence of progress, suggest the question: What would be done if Unity of Control existed? It is suggested that the "C. O." would probably advise a very simple measure as a way out of the difficulty, namely: That all yarns be made 10% finer than at present. Such would be in effect dilution, because by this simple change the consumption of the world's spindles on that basis would be changed in the proportion of from 20,800,000 bales to 18,000,000 bales. The extent of the dilution in figures amounts to the spinning of 11s instead of 10s, 22s in the place of 20s, 55s as the substitute of 50s. If such could be carried out it would not be necessary for the mills to reduce the hours worked in order to make this year's supply sufficient for requirements. Further relief would arise from the spinners of yarns of low counts making these from lower cottons and the use of waste wherever practicable. At the present time considerable quantities of cotton waste are used by other trades which could be advantageously spun into yarn. This phase will be dealt with at a later stage. At this point attention may be given to the inherent elements underlying the use of substitutes for American cotton. These elements may be summarized for consideration as follows: What is done; How it is done; What is possible and how.

What Is Done?

A very large portion of the yarns spun in the United States is in coarse counts, a considerable amount of this being of a quality which, in the opinion of good judges in other countries, is too good for the purpose for which it is used. Other things being equal these yarns could be made from a cotton which would be more economical whilst at the same time the qualities of the product would not be detrimentally affected. This is applicable in a general way as one direction in which the substitution of American may be considered. Having decided the lines which offer the most attractive features, the question of the suitability of the existing plant and the changes necessary to adapt it for these must be approached. To accomplish the latter, the experience of those engaged on similar work offers the best source of information of "What is done." By this means it is possible to begin, as it were, "where others leave off." To do this it is also necessary to review the machinery employed and the methods adopted in the various countries where the outside growths are used alone and with American cotton. The American spinning industry being occupied in the production of all the counts and qualities of yarn which can be spun from its cottons, the question of equipment must necessarily cover the full range. But special reference must be made to those sections in which the substitution is likely to be most promising and extensive.

The Equipment

The following machines comprise the different systems in common use:

(1) Mixing—Opening and Cleaning—Condenser carding—Spinning.

(2) Mixing—Opening and Scutching—Condenser carding—Spinning.

(3) Mixing—Opening and Scutching—Breaker carding—Derby doubler—Condenser carding—Spinning.

(4) Mixing—Opening and Scutching—Breaker and Condenser carding—Spinning.

(5) Mixing—Opening and Scutching—Cards with multi-coiler—Slubber—Spinning.

(6) Mixing—Opening and Scutching—Cards with double doffers and coilers—Drawing—Slubbing—Spinning.

(7) Mixing—Opening and Scutching—Carding—Drawing—Slubbing—Spinning.

(8) Mixing—Opening and Scutching—Carding—Drawing—Slubbing—Roving—Spinning.

(9) Mixing—Opening and Scutching—Carding—Drawing—Slubbing—Intermediate—Roving—Spinning.

(10) Mixing—Opening and Scutching—Carding—Drawing—Slubbing—Intermediate—Rover—Jack—Spinning.

(11) Mixing—Opening and Scutch-

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ing —Carding —Derby Doubler — Finisher carding —Drawing —Slubbing —Intermediate —Roving —Jack —Spinning.

The foregoing list does not include the equipment for combing, because it is thought that the purpose in view may be best served by confining the references to carded qualities. The outstanding features in each of the lists of machines given in the different systems numbered 1 to 11 are now dealt with in numerical order and as follows:

Comments on System No. (1)

This equipment is in use in many parts of the world and particularly on the Continent of Europe. It is best adapted for the production of very coarse yarns, and is used below 6s. under ordinary circumstances. In general principle the plant is varied slightly in its application to the different classes of work. The following is a general statement of the various modifications:

The mixing may be carried on mechanically or manually. In either case it aims at a stabilized blend so that the cotton passing into work is at all points and times the same exactly in its working properties, etc. The adoption of manual or mechanical means is decided by the size of the unit and the cost of labour. With small units and a low consumption it would not be economical to employ mechanical mixers. With very large productions it is not only more economic but it is done better and more reliably by the mechanical method, however cheap may be labour.

The Opening and Cleaning

The machinery may consist of anything from a primitive willow to the most elaborate opener combination. This is decided by the nature of the work to be done. A primitive willow would suffice in cases where the amount of material to be opened and cleaned is within the capacity of one person and one machine; always provided the worker can be trained to discriminate in the matter of treatment in seeing that the work is properly carried out. Otherwise a machine, provided with an adjustable timing motion for regulating the period of treatment is essential.

With requirements in excess of the powers of one person, the machines should be fitted with continuous acting feed and delivery, designed and operated so that the opening and cleaning powers may be regulated, separately or together, to adapt the machine for treating cottons of varying resistance to opening and response to the cleaning elements.

In operating big units the equipment usually comprises: Automatically controlled willows; various porcupine combination openers; Creighton openers with single or double cylinders and possibly additional cleaning units attached, all in one combination, with attachments to enable one of these cylinders to be cut out and also for ranging the speeds so that the most effective speed may be ascertained as the cottons vary in their resistance and cleanliness. Also, means for the adjustment of the cylinder clearances and bar spacings, etc. These units are fitted with some form of automatic supply attachment to the hopper feeder, as well as with a conveyor for receiving and conveying the treated cotton to the required point or to the next process.

The Condenser Card-Feed

This is supplied with the loose cotton from the opening and cleaning machines just named. Each card being fed by an auto-feeder which spreads the cotton on the feed apron in a uniform manner. The thickness or weight of the feed can be adjusted to requirements by a simple balance.

The type of card preferred for this work is the roller and clearer, the revolving-flat type being too refined and sensitive to give satisfaction. The modern "R. & C." card is a great improvement on its predecessor. For such work as that under consideration it would be provided with a "Humbug-Roller; its function is to assist in relieving the congested bodies of matted fibres as they are taken by the lickerin from the feed. It is an auxiliary roller, 3-in. or so in diameter, clothed with wire of a similar nature to that on the lickerin, but with its points, on the lickerin side, directed upwards, or opposed to those on the latter. Its position is immediately beneath the feed rollers and as close as possible to that part, as well as to the lickerin, but always out of contact. It effectively relieves any matted condition in the stream of fibres passing this point under the influence of the lickerin. Incidental-

The grids and undercasings are in various designs in accordance with the character of the cotton used, the general conditions governing these parts being those commonly observed, except where the circumstances are such that no extraction of waste is desired at this point, in which case they are either made of plain sheet or perforated metal.

The Rollers and Clearers

The first of the rollers is rendered more effective by clothing with coarser wire of the flat or convex section with a very keen point. This is often named the dirt roller and is worked without a clearer. The modern types of this machine have improved ends which minimise the passage of air and prevent accumulations of cotton on them. The most effectual method is to enclose the end of each roller or clearer by means of what may be described as a shrouded end and bearing. This consists of a disc cast on the inside of a boss which fits as a loose bearing on the end of the roller shaft and rests in the customary bracket. The disc portion projects to just short of the wire and flush with the edge, along its face. Thus it enshrouds the end and prevents air from free access and egress through the aperature in the wood cover which is used to enclose the upper portion of this machine.

In some instances a slight reciprocal movement is imparted to one or more of these rollers, the object of this being to extend the distribution of the stream of fibres passing this point whenever they are present in bodies of varying density widthwise of the machine. Thus the fibres are thereby caused to move on extending lines in a manner which acts correctively when irregularities are present at any point in the passing stream of fibres.

On account of the heavy production usually required in this class of work the stream of fibres is such that the carding points are always engaged to their fullest capacity. The presence of any interfering influence on the flow of the fibres causes congestion and overcrowding in proportion to the extent of that influence. Such overcrowding extends cumulatively, until every part is affected, when the interference continues. This has the effect of preventing the various parts from exercising their functions and the fibres become attached in confused bodies and damaged by the friction resulting. When acute, the fibres become nepped by the mincing action thus set up. Such also is the effect when overloading is practised or developed from defects such as sluggish action, etc.

The safeguard against such defective actions lies in the prevention of any hold-up in the flow of the fibres at any point. The most sensitive point of all is the removal of the fibres from the cylinder by the doffer, which is the means of the outflow from the carding elements. An additional safeguard is the use of the fancy and fancy-clearer.

The Fancy and Fancy-Clearer

The fancy and fancy-clearer have for their function the placing of the cotton on the passing cylinder surface in such condition that the doffer acts most effectively in its removal. The fancy is a cylinder 12 to 14 in. in diameter clothed with soft long wire resembling that used for stripping brushes. This operates on the part of the cylinder immediately over the doffer in such manner that the stream of fibres carried by the cylinder is placed so that it is taken off more effectively by the doffer. This is accomplished by the wire of the fancy entering slightly amongst the points of the cylinder and the hooked point of the former lifting the fibres from below the surface, when in correct order. The fancy clearer takes any cotton which may adhere to the fancy from it and places it back upon the cylinder. Its position is, therefore, so that its surface just clears the two parts named. Its teeth are similar to those on the rollers and clearers and its diameter is about 3½ in. Their functions are again repeated as follows: To place the cotton in the best state for removal from the cylinder, and thereby ensure the perfect outflow of the fibres as they are carded. If they fail to do this then the spaces about the points of the cylinder gradually fill up and eventually the surface becomes overloaded and thus, the intensity of the fibres gradually increasing, changes the carding action to one of intense friction and mincing.

The condenser attachment is constructed with many variations. Its mechanisms embrace parts exercising three distinct functions, namely: Dividing; Condensing; Putting-up. These operate as follows:

Dividing: this consists of subdividing the carded web into the required number of ribbons each being equal portions.

Condensing: the condensing of the ribbons by rolling or rubbing each into a round band or rove so that the fibres are suitably compressed and cohere.

Putting-up: the winding of the numerous roves in a form suitable for conveyance to and use in the subsequent process.

The principal makes of Condenser may be represented as belonging to some one of the three following systems: (a) The Ring Doffer; (b) The Blade Divider; (c) The Tape Divider. A short description of the characteristic differences of these different types is as follows:

The Ring Doffer system: In this system the card doffer is clothed in as many distinct rings of cardwire points as the number of ribbons it is required to make. Each ring of card wire has a filled space separating it from the adjacent rings, sufficient only to render the collection of fibres on each distinct as taken off by the doffer comb. These ribbons as they leave the doffer droop on to a V shaped disc-grooved roller placed under the doffer comb. This roller is constructed with as many V shaped grooves as there are ribbons. As the ribbons droop on to these grooves each tends to fold in scroll form or C fashion. This roller has a surface movement which suffices to keep the ribbons in slight tension. The ribbons pass on to and are moved forward by passing between a pair of endless supple leather belts, of the width co-extensive with the card, called the rubbing aprons. These are moved, at the rate necessary to keep the ribbons in slight tension, by rollers upon which they are mounted. The mountings cause the inside portions of the two belts to be pressed together with the ribbons between them. At the same time a reciprocal movement is imparted to the belts in opposing directions, which has the effect of rolling and advancing each ribbon at one and the same time. This completes the condensing of the cotton into a rolled band or rove.

The "Putting-Up" of the roves, delivered by the rubbing belts or condenser:—These are received by being wound upon one or more bobbins at a rate which keeps each in slight tension. The ends are separately controlled by guides attached to a bar which is reciprocated, the traverse being regulated to wind these in the well known cheese formation. It is in this state that the material is prepared for presenting to the spinning machine.

(To be Continued)

"We Should Know More About Our Business"

Necessity of Balancing Production and Consumption—Desirability of Quick and Accurate Analyses of Market Situations—Statistics Should be Gathered by Various Industries Themselves—Domestic Commerce Division Supplies Vehicle for Establishing a Budget

By *Irving S. Paull,*
Chief, Domestic Commerce Division, Department of Commerce.

"I WOULD like to look at some muslin, please—something rather good. This will do nicely—I will take 10 yards."

This scene is being enacted every day in thousands of retail stores in every part of the country. The customer may not call for muslin—she may ask to look at gingham, madras, percale, dress goods, silks or any other one of many different textiles. She may not buy yard goods at all; instead she may purchase an apron or house dress for herself; a pair of rompers for the kiddie; shirts, underwear or hose for husband or a suit for the eldest boy. She is Mrs American housewife making some retail purchases, and she represents the American household as purchasing agent. Her buying power is tremendous, but it has its limits, just as the consuming power of the American household has its limits.

Did you ever stop to think what effect a simple sales transaction at the retail counter has? Let us think about it for a few minutes—we may be able to gain a new idea or two which will be of some little value.

First of all we must realize that when a woman goes to a retail store to make a purchase, she is ordinarily replacing some commodity which has become useless, unserviceable or undesirable. She spends a certain sum of money to make that replacement. The money goes into the merchant's cash drawer as a part of the day's receipts.

Eventually a portion of that money goes to help pay for the merchant's overhead charges—rent, light, heat, taxes, depreciation, interest, salaries and wages, advertising and the like. It would be possible as well as interesting to trace how this portion of the purchase price goes to the support of various individuals, organizations and public enterprises in the city where the store is located, but we have not space here to consider this.

A second portion of the purchase price goes to cover the original cost of the goods to the merchant, and to replacement thereof in his stocks when occasion requires. The remainder is the merchant's profit.

Wide Influence of Purchases

Now consider: The customer through her purchase of a needed commodity has helped to maintain the store at which she spent her money. She has also assisted in giving employment to few or many employes of the store, according to its size, and to those dependent upon them. She has helped to make it necessary for the merchant eventually to re-order more goods from the wholesaler, and thereby to maintain the latter establishment with all of its necessary overhead charges, corps of employes, etc., and in turn to make it necessary for the wholesaler to order more of the same or similar goods from his source of supply. Finally she has helped to make it necessary for the mill to continue to operate its looms, giving employment perhaps to thousands of workers who also have dependents; and for the mill to place further orders with a cotton broker for raw material from which to make more cloth. In turn this creates a call on the cotton grower to raise another crop with which to meet the demands of industry. The *effects* of that simple purchase of a few yards of cotton cloth at the retail counter, (assuming the purchase was of cotton yarn goods) are more extensive than the average individual realizes. But let us go further:

Thousands upon thousands of other workers are called into action by the withdrawal of that cotton cloth from the merchant's stock. The railroads, express companies, mail service, telephone companies, printers, engravers, truck drivers, brick masons, carpenters, electricians, machinists, bank officials and employees—everyone in industry and distribution is more or less affected by that purchase. For Mrs. American Housewife represents the ultimate consumer; and it is upon the power of the ultimate consumer to purchase the products of our factories that the prosperity of the country depends. Further than that, real property depends more than we may imagine on the power of the consumer to purchase and use the products of the factory as rapidly as they are fabricated. Putting it the other way around: The prosperity of the country depends almost entirely on the production of the factory being so gauged that it will be in proportion to the ability of the people to consume commodities currently—to "use them up" as rapidly as they are produced, if we may employ a common and very expressive, if not very elegant phrase. The reason for this will be apparent on a moment's reflection.

Crisis of the "Business Cycle"

The so-called business cycle is receiving a great deal of attention and study by economists. Without endeavoring here to analyze the cycle it may be said broadly, that a period of prosperity usually evolves into a "boom" stage with intense activity in all lines, which is followed by a crisis, more or less acute, and which checks further expansion. A depression of greater or less intensity follows, which in turn gradually works into a recovery of business activity and prosperity, only to be succeeded by another boom and a repetition of the cycle.

It is with the crisis of the cycle, and its causes and effects that we are here chiefly concerned rather than with the whole cycle. Almost without exception in times of crises, retailers, wholesalers and manufacturers find themselves with large excess stocks of goods on hand. Such stocks were manufactured, and purchased by distributive agencies, while prices were at or near the peak. With the coming of depression they lie idle, acting like a great financial sponge, absorbing the capital and credit of the entire country and blocking the channel of distribution as effectively as a concrete dam blocks the flow of water in a river across which it is built.

It is not until such excess stocks gradually trickle off, so to speak, and reach the hands of the consumer, that industry again shows signs of reviving, for the retailer cannot buy from the wholesaler, nor can the wholesaler buy from the manufacturer while each of them is laboring under such a load; and the manufacturer, his own warehouses filled with idle completed products and raw materials, cannot continue to make further purchases from the producer of such raw materials, nor to run his factory at its former speed when there is little or no demand for his goods. Therefore some or all of his machines are shut down, employees are discharged, and with their incomes cut off, temporarily at least, they must economize rigidly.

This condition affects the retailer directly; for economy in the home means reduced buying; the retailer therefore curtails orders to the wholesaler, who necessarily must in turn cease buying from the factory. The flow of products through the channel of distribution has met with three dams of idle stocks and has "backed up," causing idleness in industry, semi-idleness in distribution and unhappiness, perhaps even misery to the whole people. Thus we find ourselves in a depression from which we may be a long time in emerging.

Cause of "Cycles"

What has led to these recurring cycles of prosperity and depression? Without attempting to answer fully, it may safely be said that one of the chief contributing causes is that our volume of production is not so gauged as to meet the current consuming power of the people. This is true because we never have measured that consuming power; and because this never has been measured the manufacturer has no pressure gauge by which to regulate his operations. Consequently he is working entirely too much in the dark.

In Colonial days he had no problem of distribution. Factories were mostly neighborhood affairs, producing for the current needs of people close at hand. The manufacturer could dispose of all the goods he could make. His problem at that time was one of volume and cost of production.

As the country developed the manufacturer found his demands multiplied. Calls were made on him for goods to supply a market at a constantly increasing distance. And so he was forced by circumstances to turn distribution over to wholesalers and other agencies, and concern himself only with the problem of producing goods in volume at the lowest possible cost per unit.

From that time, factory production has been carried on without real knowledge of the needs of the people so far as current consumption is concerned. Spurred by the desire to make the most of opportunity the manufacturer has endeavored to get his share of the business—and a little more if possible. In doing this he and his distributive agencies innocently bring about an unbalanced condition of manufacture as related to current consumption, which undoubtedly is one of the chief contributing causes of the business cycle with its culminating crisis and consequent depression.

Knowledge of Facts Needed

What we need today, more than any other one thing, is to know the facts about business. Such facts are pitifully scarce. Those that exist are so widely scattered and our knowledge is so thinly spread out that it is unavailable for reference. Business has two great needs: One is to measure the consuming power of the people; the other is to measure the producing power of the industries. When such measures have been made we shall be in position so to relate production to consumption as to establish a more nearly even flow of products through the channels of distribution and thus to avoid the high peaks of crises and the deep valleys of depression.

There are few who will quarrel with the statement that the most economical system of manufacture and distribution will be the one in which

raw materials are, so to speak, drawn into the factory, and from thence on through the various processes of manufacture and distribution by the suction of consumer demand. If that condition is established there will result a condition of prosperity of indefinite duration.

Factories can operate at normal capacity, manufacturing in response to known demand. There will be none of the wide fluctuations in the number of employees now so frequent. It would be possible to so standardize production as to permit of the lowest cost per unit. Employment will be stabilized, not only in industry but in distribution and in the trades as well. There will be none of the widely fluctuating demand for labor that is now so common and so harmful.

Under such conditions the normal income level of the people will be raised. That level today is the average of the high-wage income of prosperous times and the low-wage income of depressions. A steady, continuous demand for products which will be consumed as rapidly as produced will necessarily tend to raise that level and with it the purchasing power of the people.

Make Market Analyses

So then we should make our measures of consumption and production as quickly and as accurately as possible. Admittedly this is not an easy task. Market analysis is not a simple undertaking for the untrained individual; but an attempt to make such an analysis should be made by every retailer, wholesaler and manufacturer so far as his own activities are concerned. Not only that: The great trade associations in all lines should undertake to make a very real and scientific survey of the buying power of the people as a whole, and to measure the producing power of each line of industry.

This is a job that must be undertaken by the industries themselves. It is a job too large for any single agency to attempt. Such figures as are needed must be gathered, compiled and published quickly in order to be of current value. Further than this, a survey made by any one agency, either public or private, doubtless would not be unanimously accepted as trustworthy; for it is not too much to assume that facts will be brought to light which will not coincide with the popular beliefs that exist, and that the industries would be prone to question the importance, if not the correctness of such facts if gathered by an outside agency. But if the industries themselves, through their trade associations, will undertake to collect the facts regarding their own activities their findings will readily be taken at face value. Further than that, the task will then be so greatly subdivided that the figures can be gathered rapidly enough to enable the Government to compile and distribute them promptly, for the benefit of all concerned, through the Department of Commerce.

Need for Statistics

What is the production today of the factories in each field of endeavor? What is their maximum capacity. What is the volume of goods enroute from the factories to the wholesaler or other manufacturer's distributive agency? What are the stocks on hand in the wholesale and retail stores? What is the normal consumption of such goods by the people? Is the demand increasing or decreasing? What are the factors of material, manufacturing and distribution costs of such goods, as reflected in terms of the consumer's dollar? These are only a few of the facts that business needs to know about itself. Isn't it about time we endeavored to learn them?

There is, it is true, a reticence on the part of many leading concerns to furnish such statistics. Some manufacturers have said that they will be willing to furnish the facts if given assurance that their customers in turn will give similar information as to their stocks on hand, purchases, etc. It is not too much to hope that such co-operation on the part of all business interests will soon be manifest.

No Secrets in Business Today

In the olden days there was great secrecy in business. For instance, if Smith discovered an easier way of keeping his accounts than that in general use, he guarded it closely. Why should he give a competitor the benefit of his study? And that was the general view taken by all business men. But as the years passed and commercial and noon-day clubs came into being, and business publications made their appearance, we quickly changed our attitude. So today if Smith makes an improvement in his system of accounting, he publishes it to the world on the theory that all business benefits just in proportion to the increase in efficiency; and in return for his contribution to progress, he reads, perhaps in the same magazine which contains his own article, several other valuable ideas which he can adapt, if not adopt. And so we are progressing, not because we are discovering newer and better ways of doing things, but because we are telling each other about them.

A Budget Service

The Domestic Commerce Division of the Department of Commerce is, so to speak, a service station. We do not initiate, supervise or direct. For initiative belongs with business; service belongs with the Government. It seems to us that the best service we can render will be to assist in measuring the consuming capacity of markets so that manufacture may be budgeted to maintain the steady flow of material through the processes of manufacture as stated above. We are ready to assist in any way we can consistent with the functions of the Division.

Our trade volume never will be more than the market can consume, and if we diminish that market through interruption of purchasing power, then it follows that our production will be less than it normally would be — less than it should be.

When industry appreciates this truth and realizes that the Domestic Commerce Division stands ready and willing to assist in every way possible in promoting our commercial activities; that we hope before long to become a great clearing house for business where facts will be assembled and disseminated in such form as to be useful to all and injurious to none, then it is not too much to hope that the vital facts which are so much needed will be forthcoming from all sources, and that rapid and general distribution of such facts to the industries affected will work toward the establishment of a normal prosperity so greatly to be desired.

Twenty Years Ago in Silk Trade

Majority of Leading Firms Still Were Located in Downtown Section—Same Difficulties—"Will Raw Silk Reach $4.50"?

THE "good old days" is a favorite topic in any gathering and it is probable that the silk manufacturer of today looks back with regret and mourns the passing of happier times. Twenty years ago though back in 1904, the same old evils of over-production and slack demand had to be contended with as today.

Trade reviews in January, 1904, while congratulating the industry on its phenomenal growth, comment on the year just closed as a period of struggle, anxiety, and suspense, and state that it brought disaster to many especially in Paterson where conditions were unusually hard. Operatives are spoken of as congregating on street corners in sullen dissatisfied groups and looms all through the country were idle. Only about 50% of the loom capacity was running on the average through the greater part of the year which is about the same situation we have today. Yet at the present we hear little of unemployment — a refreshing contrast.

Twenty years ago the majority of the leading firms were still located in the downtown section around Greene and Bleecker streets. Advertisements then current gave the salesrooms of some as follows: R. & H. Simon, 63 Greene St.; Wm. Skinner Mfg. Co., 107 Bleecker St.; Phoenix Silk Mfg. Co., 106-112 Spring St. One manufacturer is spoken of as moving to larger quarters on West 17th street to be nearer the retail centers, but the concerted drift uptown had not yet begun.

Spring fashion trends in January, 1904, were just as interesting and elusive as they are today. Ribbon manufacturers were wondering whether ribbons would be an important feature of the Easter millinery. Tips on spring fashions were to the effect that shirtwaist suits in silks would be one of the leading modes. The favorite materials would be neat checks, hair-line stripes and dots and geometrical designs in blacks, navies, browns, and dark greens. Pastel shades which had never gone out since their advent five years before were to be popular. Shirtwaist suits were evidently an important item for it is stated that while buyers as a rule were reluctant to contract for spring stocks that firms making a specialty of neat fancy effects suitable for shirtwaist suits had generally booked good orders.

The raw silk market then as now furnished its wide ups and downs. Prices of January, 1904, which were then considered rather high, would today bring even a hosiery manufacturer into the market. For instance, Extra Classical Italian, $4.40; Japan Filature Extra Best, $4.40; Japan Filature No. 1½, $3.70, and Tussah, $1.92½. In the Japan silks Extra Best was apparently the top grade which ranged down to No. 1½.

Prices at the time were rather high due to the fact that the outbreak of the Russo-Japanese War was expected to come at any time. Speculation had carried prices up and an advance of 10c. a pound in a day is mentioned. Divergent views then as now were heard as to the future trend of prices. Some believed that the outbreak of war would cause the Japanese to hasten to sell, while others confidently counted upon war to put prices still higher. A Paterson man is quoted as saying that business had been so dull that even prospects of a war would not induce buying of raw silk beyond current requirements. It is interesting to note that after the actual declaration of war prices did decline for several months to below $4.00 for Japanese silk. Later on the market rallied and in the fall months of 1904 as prices continued to move upward it began to be wondered if raw silk would reach $4.50.

The present tendency to continually lower the quality of silk delivered against specific grades makes one wonder if we have gained anything over the grading of 20 years ago. Then Extra Best was the top grade while today an Extra Best can hardly be used for warp stock. No. 1½, the lowest grade, has ceased to be a factor in the export market as has likewise No. 1, Shinshiu No. 1 and Kansai No. 1. On top of Extra Best we have piled XXB, XXA, XXA crack, and Special Cracks and Grand Extras with the end not yet in sight.

Style indications are now very indefinite. Most retail buyers in a position to feel the pulse of the buying public believe that the prints will be good throughout the spring without question. There is a wide difference of opinion as to just what type prints will be wanted but that the prints are wanted is agreed.

A New Record in Artificial Silk Production

Total Manufactured in United States in 1923 Was Over 35,000,000 lbs., According to Official Statements from Producers—Plans for 1924 Contemplate Output of More than 41,000,000 lbs.—Weaving Trade Looms Up as Great Potential Factor in Increased Consumption of This Fibre

THE last quarter century has witnessed many industrial romances—stories of new phases of production which grew up over night and which became commanding industries in that short space of time. Undoubtedly the one which comes first to mind and which has aroused the greatest popular interest is the growth of the automobile industry. However, in our own textile manufacture there have been at least two romances whose scene was laid in the last 25 years. One of these, the mercerizing industry, is treated at length elsewhere in this issue. The other, the artificial silk industry, represents one of the most remarkable achievements in the history of textile manufacture—remarkable in that it has meant the addition of a new textile fibre to the limited number of important basic materials.

Although the first patent on the process of manufacturing artificial silk dates back to 1884, it was not until the end of the nineteenth century that production in Europe reached a commercial basis. It was a good ten years later when this country joined the ranks of artificial silk producers but the progress made since that time has been noteworthy. Particularly significant has been the growth of the domestic industry during the last few years. Commencing four years ago, the curve has made a sharp turn upward until in 1923 the total quantity produced was 250% greater than that of 1920.

Those who visualized the spectacular increase in the production and use of this material in the immediate post-war years as an emergency proposition which would subside when the unprecedented demand for materials of all kinds dropped off, are still waiting for the collapse of the artificial silk industry in this country. Instead of falling off, the production has continued to make rapid strides all through the years of depression and readjustment and has not lost ground at any time.

Through the courtesy of the various manufacturers, TEXTILE WORLD has been able to secure each year official figures on the total quantity of artificial silk produced by them. The total for 1923, based on these statements, was 35,490,000 lbs., as compared with a production of approximately 10,000,000 in 1920. Nor does the story stop here. Most plants are increasing their facilities, and according to their own statements the total produced by these same firms in 1924 should be approximately 41,600,000 lbs.

In order to present a complete picture of the industry, brief reference will be made to each of the manufacturers whose production has been a commercial factor.

The Viscose Company

The Viscose Company, with main plant at Marcus Hook, Pa., but with other units located at Lewistown, Pa., and Roanoke, Va., is still the commanding factor in the industry. This company produced last year 27,500,000 lbs. and at the end of the year was producing at the rate of 30,000,000 lbs. per year. Extension of its facilities now under way will bring its 1924 production to the neighborhood of 32,000,000 lbs., although the company states that it will be able to increase this figure slightly if the demand justifies it.

This organization, which started production in 1911, and which for nearly a decade was practically the entire American industry, is continuing to expand. It will be recalled that the new plant at Lewistown, Pa., was started in 1921 and also the capacity of the Roanoke plant has been materially increased. A third step in this direction was taken during the last year, when the company secured a site within the city limits of Philadelphia and commenced to make plans for the erection of a new unit.

du Pont Fibersilk Company

The du Pont Fibersilk Co., Buffalo, N. Y., which started production in 1921, operating under French Viscose patents, has realized the increased production resulting from the doubling of the capacity of its plant. It will be recalled that this organization was originally laid out for an output of 1,500,000 lbs. per year and that this was the amount produced in 1922. The 1923 production was nearly double that amount, being 2,750,000 lbs. and the firm expects to manufacture approximately 3,500,000 lbs. during the coming year.

An event of considerable importance in connection with this company was the purchase of a large tract of land in Nashville, Tenn., formerly the site of the old Hickory Powder Plant. Construction of a new artificial silk unit will be started on this site this year and it is expected that the plant will get into operation early in 1925.

Tubize Artificial Silk Company

The success which has marked the efforts of the Tubize Artificial Silk Co. of America since it started to operate its plant at Hopewell, Va., in June, 1921, has been unabated and in 1923 this firm produced approximately 3,500,000 lbs. as compared with 2,600,000 lbs. in 1922. Although the company has not planned any marked increase in its plant facilities during the coming year, it has been extremely active in the development of its community at Hopewell in order to provide for the continuance of the excellent employer-employe relations which exist there. The village now contains over 300 houses, all equipped with sewage, running water, light, etc.

Industrial Fibre Corporation

The Industrial Fibre Corporation of America, Cleveland, Ohio, which has been operating under Italian Viscose patents since the fall of 1921, produced 1,200,000 lbs. during 1923 and its schedule for 1924 is based on a production of 1,500,000 lbs. This company has continued to make progress. It has in contemplation no plans for increases in plant facilities, with the exception of such slight enlargements as may result from modification of the present plant.

Cupra, Incorporated

Cupra, Inc., at Clifton, N. J., operating under the Cupra-ammonium process, was a new-comer to the ranks of commercial producers during 1923. It reached a production of 1500 lbs. a week in July of last year but plans to increase its output to 2,000 lbs. a day during the coming year. The company has realized the necessity of increasing the volume of its production and is planning to do so as rapidly as equipment can be installed.

The Lustron Company

The Lustron Co., South Boston, Mass., has maintained its production at the rate which prevailed in 1922, that is, approximately 500,000 lbs. per year. This company is contemplating the increase of its plant facilities and output but has not decided definitely just when this will be initiated.

Other Companies

This statement has referred merely to those companies whose production was sufficiently large to represent a commercial factor. It is realized, of course, that there are other firms whose output in the future may be an important item, but who are still in the preliminary stages of manufacture. One such firm particularly is the American Cellulose & Chemical Co., Ltd., with plant at Amcelle, Md., which has awarded contract for construction of an additional unit and which promises to be an important factor in the ranks of artificial silk manufacturers. This company operates under the acetate process. In addition, there are a number of others whose promoters are busy with plans at the present time but whose schedules are not sufficiently definite to warrant publicity just now.

Significance of Total

It is significant to note that the total amount manufactured in 1923, which was approximately 35,500,000 lbs., exceeds by 2,000,000 lbs. the quantity estimated by these same firms at the beginning of the year and published in the 1923 Annual Issue of TEXTILE WORLD. Not even the producers themselves have been able to forecast the apparently unlimited opportunities for expansion in the use of this remarkable fibre. The last year was certainly not one of decided activity in the textile industry, as a spirit of caution hampered operations during most of the 12 months, and yet the domestic artificial silk industry was able to increase its production by nearly 10,000,000 lbs. as compared with 1922 the total for which was in the neighborhood of 26,000,000 lbs.

The United States is rapidly becoming the most important single producer of artificial silk in the world. Definite statistics for world production of this fibre are not avail-

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ARTIFICIAL SILK PRODUCTION OF THE UNITED STATES

Following its custom of several years, TEXTILE WORLD has secured from the leading artificial silk manufacturers of the United States a statement as to the quantity actually produced by them during the year just closed and quantity they will probably produce during the coming year according to present plans.

The figures for 1923 and 1924 follow:

FIRM	1923 PRODUCTION	1924 ESTIMATE
Viscose Company	27,500,000 lbs.	32,000,000 lbs.
du Pont Fibresilk Co....	2,750,000 "	3,500,000 "
Tubize Artificial Silk Co.	3,500,000 "	3,500,000 "
Industrial Fibre Corp...	1,200,000 "	1,500,000 "
Cupra, Inc.	40,000 "	600,000 "
Lustron Company	500,000 "	500,000 "
TOTAL	35,490,000 "	41,600,000 "

How Much Hosiery Can be Sold to Retailer Direct?

Dissatisfaction with Jobber Distribution in 1923 Causes Increasing Consideration of Direct Selling—Its Capital Requirements Should Be Fully Studied in Advance of Adoption—"Back-Door" Merchandising Not a Solution—Jobbers Will Always Distribute Mass Production of Staples

IT has become the fashion nowadays to knock the jobber. As a vital cog in the distributing machinery for many classes of textiles he is gradually but surely losing ground, say many prophets of "new era merchandising." He does not do this, not to mention that, which he should do automatically in exercising the functions of his office. He is not what he used to be, the jobber, "they" say. Let's eliminate him, with three cheers for modern merchandising.

During periods of irregular business it is natural that dissatisfaction with that which exists should increase. When things as they are do not seem to be working so well it is only human that something different making for things as they might be takes on an added glow of attractiveness. Slow business allows more time for the consideration and nursing of grievances, imaginary or real and for their violent expression. It is usually possible to take out one's troubles on someone, and the jobber is a handy and never failing target to attack.

This may not be a sufficiently serious introduction to an extremely serious subject: Selling Through the Jobbers vs. Selling Direct to the Retailer. For it is not to be questioned that last year witnessed a spreading of dissatisfaction with jobber distribution by many mills and their selling agents, particularly in the knit goods field. Especially is this true in the hosiery business, and it is the purpose of this article to discuss briefly both sides of the question, sticking closely to hosiery, in the general terms which only are possible.

Dissatisfaction with Jobber

It is necessary, at the beginning of the discussion, to accept as a fact the statement that business for many hosiery mills selling the jobber was not all that it might have been during 1923, from the standpoint of percentage of profits if not from that of volume. Close buying by jobbers featured the entire year. Advance business in most cases was considerably smaller than usual.

Naturally under these conditions there were many small lot duplicate orders, with requests for deliveries which mills considered unfair. Merchandise was "bought today for delivery yesterday." Severe competition kept prices low; overproduction and distress stocks of merchandise reduced normal profits, or wiped them out altogether.

In other words, the jobber has operated, and is operating, on a scale closely akin to the methods pursued by retailers. He is expecting mills to "hold the bag" for him, and that is exactly what many mills are doing. His old time policy of placing quantity advance business with mills, allowing them to map out production schedules for a considerable period ahead, is certainly not what it used to be.

"So," say some mills and selling agents, with some logic, it must be admitted, "if we are to do business in retail quantities, why not sell the retailer direct, and not bother with the jobber at all."

Well, why not?

Profit Comparisons

The big appeal of the direct-to-retailer business for those not now engaged in it is the net profits shown at the end of recent fiscal years by outstanding successes among large direct sellers. The jobber-mill executive scans these annual reports, compares them with his own balance sheets, and weeps bitter tears of envy. He is missing a trick. Will he continue to struggle along with the conservative jobber and his small profit margin? He will not. He will step out and enter the lists with those who are reaping the benefits of easy volume and relatively large profits in selling the retailer.

Will he? Let us see what he will have to look forward to.

Capital Requirements

In the first place, capital. The manufacturer who contemplates discarding the jobber must first of all give careful consideration to the increased capital he must have to swing a business run exclusively on sales direct to the retailer. It goes without saying that a mill must be large, or good sized, and be equipped to make a fairly complete line of all kinds of hosiery, before it can even think of successfully distributing to the retail trade only—that is, a mill whose directors are in their right senses.

Provision must be made for sufficient capital to carry the large, complete stocks of made-up merchandise which are essential; the manufacturer must be prepared to finance warehouse facilities in important distributing centers; he must be prepared to enlarge his sales force with capable men, and increase his selling expense considerably; he must be prepared to meet a larger overhead generally.

And when all these things are taken care of he must be sure to have enough money in the bank, or readily available, to carry the business while it is going through the arduous process of establishing a reputation for quality and unfailing service with the retailer, and building up and holding a sufficient number of accounts to assure profitable volume.

Anent the difficulties of doing all this, and more, listen to John W. Mettler, president of the Interwoven Stocking Co., speaking before the convention of the National Association of Hosiery and Underwear Manufacturers last April:

Quoting Mr. Mettler

"When a manufacturer turns from selling the jobber to selling the retailer he steps into an entirely new business. Unless he knows pretty well what he is about before he undertakes it he will find it a step from daylight into darkness.

"Do not allow yourself to be misled by the finished accomplishment of some one outstanding success by overlooking the many years of struggle underlying a slowly developing growth.....

"You cannot expect a dealer to handle your line unless you extend him sufficient credit to get enough of your goods to fully cover the requirements of his own trade after he has introduced your line to them. You must be prepared to extend credit, even when it involves risk, to the extent of the customer's requirements.....

"The third fundamental is the dealer's margin of profit. This he will expect to be approximately 33 1-3% of his retail selling price, or a mark up of close to 50% on cost.

"..... you will find much to your surprise perhaps, that you will have a greater investment in your selling department than in your manufacturing department.....

"The most profitable hosiery mills in this country distribute through the jobber

"I have no doubt that some of you who have been listening to this rambling discussion have been trying to figure out how in the world we did survive, and you may have been looking for some one good reason why ..... I will tell you the one big secret of the Interwoven success—we have always had damn good luck."

No one is better qualified to speak on the requirements for success in selling hosiery to the retailer than Mr. Mettler. Making all allowances for his natural disinclination to paint too attractive a picture and thus encourage competition for himself, his address should none the less be an interesting study for those who contemplate entering the retail field.

Rumors flood the primary hosiery market about the numbers of large manufacturing organizations which are seriously considering turning their business away from jobber distribution to direct selling methods. None of these rumors can be confirmed, of course, inasmuch as secrecy is essential to the success of a gradual transition of an established business selling through jobbers.

"Back-Door" Selling

This leads naturally to a consideration of the possibilities of following two masters—the jobber and the retailer—at the same time. The path of this procedure is not altogether a rosy one, as may be demonstrated by a number of concrete examples, and the conservative selling agent holds firmly to the conviction that it is not possible successfully to sell out of both the front and the back door at the same time.

It is difficult to keep secret the knowledge that retail accounts are being handled by those theoretically selling the jobber only, and the jobber's action when such knowledge comes to him is swift and decisive.

None the less there is unquestionably a considerable amount of this "two-way" distribution going on at this time. In the words of an important mill representative: "Of the 1,000 hosiery mills in this country which amount to anything, probably 999 of them are selling at least a few retail accounts."

This statement is probably an exaggeration, yet it indicates what may be considered a trend of the times. Many consider it a dangerous trend, and such it would seem to be to the impartial observer.

The soundly established and well organized mill which is following a definite and carefully considered policy along these lines is not in need of, nor desirous of receiving advice. But the smaller mill which has no well-thought-out plan of operations, but which is merely flirting with the retailer in an indefinite way, needs more than advice—it may very well need a guardian.

This whole question of jobber distribution versus direct selling is an open one, and there can be no dismissing it with a few flat statements. A larger New York department store did a bigger volume in 1923 than some of the largest jobbers in the Middle West. It is unreasonable to expect this retail organization, and others in its class, not to want to buy direct from the manufacturer; it is understandable that mills selling the jobber should want to consider this type of retailers logical accounts for themselves.

A Possible Solution

Mail order houses are now generally classed as entirely proper "jobber" accounts. Conservative selling organizations still refuse to sell the chain store, but their number is not large. It is not possible that the next development will be something along the line of the attempt some years ago to classify retailers doing a yearly volume of business in excess of a certain fixed amount as

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The Use and Abuse of Trade Statistics

A Major Industry Devoid of Basic Statistical Data Is Unthinkable — Use Must Be Governed by Sound Economic Principles — Limitations and Inaccuracies Must Be Recognized — One Hundred Per Cent. Accuracy Is Unnecessary

By *Alston H. Garside*, Manager Industrial Service Department, Merchants National Bank, Boston.

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IN the textile trade, as in other lines of business, there are plenty of men who declare, with the force of profound conviction, that they "have no use for statistics." There are scores who are always ready to assert, on the slightest reference to the statistical position of the industry, that "the man who goes by statistics is sure to go bankrupt." Whenever attention is called to discrepancies between the compilations of different authorities, or when some authority issues revised figures which are considerably different from its own original estimate, men rise up in all directions to insist that "most statistics are grossly inaccurate and consequently worse than useless."

Some time ago the writer came in contact with a business man who declared that if he had his way he would abolish every statistical compilation issued by the United States Government, including the census. It had come to his attention that a certain corporation had not given the Government correct figures for a certain census report, and so he felt that census statistics in particular and all other statistics in general were of no value whatever. This business man's suggestion that the census be discontinued raised the interesting question of what the situation would be if the statements of some men were taken at their face value and all statistics were done away with.

If Statistics Were Unavailable

How would manufacturers and merchants feel if, on awaking some morning, they found they had no records whatever of production, consumption or stocks of the materials with which they dealt, if they could not get any figures as to the operating conditions in their industry, if they could not secure any statistical data as to past prices of the raw materials and manufactured products in which they were chiefly interested, if they could not learn in any way about the quantity of exports or imports of the commodities which they were buying or selling from day to day—if such statistics were entirely abolished not only for their own industry but for all other industries as well? Just how would business men take it if they could not get any statistics as to the money and banking situation, the labor supply and wage rates, the output of basic commodities and the fluctuations in basic industries?

The fact is that any sweeping condemnation of statistics is senseless. There is not a business man living who tells the whole truth and nothing but the truth when he says "he has no use for statistics." No business, large or small, can be conducted for a single day without reference to statistics of some sort. Those business men who denounce statistics wholesale attach much value to general information and opinions regarding trade conditions which obviously are founded on statistical data. The writer noted that the man who suggested the abolition of the United States Census quoted statistics considerably in discussing the business situation and he asked questions which could only be answered statistically.

A. H. Garside.

Limitations of Statistical Data

Since trade statistics comprise such an important part of the fund of information on which business men base their mercantile judgments and decisions, it may be well to note some of the principles involved in the compilation and use of them, the limitations of statistical data, and the pitfalls into which one may fall by not using such material discriminately. These principles and limitations are matters of ordinary common sense, yet they are frequently overlooked. It is the failure to observe them which leads many business men to declare their aversion to statistics and to blind themselves to the very extensive use which they themselves are making of statistical information.

In the first place, while it is perfectly right and proper to condemn inaccuracy in trade statistics and to demand that they be made thoroughly reliable, business men might well bear in mind these three facts: First, it is practically impossible to compile many of the important statistics of industry and commerce with 100% accuracy; secondly, it is not necessary that statistics be absolutely correct, but only substantially so, to be of value; thirdly, it is absurd to discard statistics which are so nearly correct that they show the broad movements of business, just because they are not 100% correct.

The deeper one delves into the common statistics of trade, such as those on exports, imports, production, stocks, and consumption of goods, the more possibilities of error one discovers. Such statistics as these comprise thousands of items based on returns made by thousands of individuals, and obviously it is not possible to hold all such individuals to the highest standards of accuracy. Anyone who has had charge of statistical compilations realizes the difficulty of securing 100% accuracy on the part of carefully chosen assistants who work under one's immediate supervision. How much more difficult is it to maintain complete accuracy in the returns of thousands of concerns and individuals scattered all over the country, who can not be penalized for inaccuracy, and whose figures, in large part at least, cannot be checked.

For example, export statistics are based on the export declarations of shippers and forwarding agents. They may be checked in part against bills of lading, but this does not insure complete accuracy. While it is true that this country's export statistics are more nearly correct than those of most other countries, and our Government is making constant effort to improve them, no official of the Department of Commerce, in all probability, would claim that they are absolutely accurate. This, however, does not make them worthless. If the Government states that exports of cotton totaled 379,694 bales this month against 436,785 last month, whereas the facts are that this month's exports were 381,062 and last month's 435,432, these errors will not cause manufacturers and merchants to make serious miscalculations, but if manufacturers and merchants ignore the figures because they are not absolutely 100% correct, they will fail to note the important fact that exports are declining.

On the other hand, business men should be constantly on their guard against statistics which are so incorrect that they are misleading. In the cotton trade, for example, one should use great discretion in dealing with the figures on acreage and production of cotton in Egypt, which are issued by the Egytian government, as it has been found impossible to reconcile these figures with the receipts of cotton at Alexandria. Statistics on production of wool in many foreign countries, including important wool-growing countries of South America, are to be handled with care. Many of the estimates of world production and consumption of cotton and wool which appear from time to time in leading newspapers should be taken with a grain of salt. One needs to follow statistics closely and continuously to know what sources are reliable and what are not, which figures should be accepted as reasonably accurate and which should be entirely ignored.

Avoid Inaccurate Interpretations

Next in importance to the accuracy of the statistics themselves is the correct interpretation of them. Many unsound, incorrect analyses of statistics are to be found in market letters of prominent brokerage and commission houses, and in leading newspapers of the country. One of the commonest errors made by trade writers in dealing with such subjects as monthly consumption of cotton and wool is to overlook the fact that some months contain more working days than others. March, for example, might have twenty-four and a half working days against twenty-one in February, a difference of 17%, which in terms of cotton consumed might account for 75,000 or 100,000 bales, and in terms of wool consumption 10,000,000 or 12,000,000 pounds. In other words, total consumption of cotton or wool might be larger in March than in February by these amounts and yet not indicate any increase in the daily rate of consumption.

Another common error made by trade writers is to publish partial returns of an industry without indicating that they are partial, thereby giving the impression that they are complete. For example, the Government's monthly reports on wool consumption cover the operations of only about 80% of the wool manufacturing industry, yet this fact is disregarded in many news articles on the subject, and the partial figures are given as though they indicated the total amount of wool consumed by every mill in the country. Partial figures have considerable value if they cover approximately the same percentage of the industry for each reporting period and if this percentage is large and representative of the whole, for the chances are that the whole of an industry moves just about the same as any considerable and representative part of it. But it is important that when partial figures are given, they be plainly labeled as such, so that they may not be compared with complete figures

on some related subject. For instance, if one took partial figures on wool consumption and compared them with complete figures on wool imports, one would probably arrive at very incorrect conclusions as to the supply of wool in the country.

Inaccurate Terms and Comparisons

Still another error commonly made in the interpretation of statistics arises from confusion of actual crops with so-called commercial crops of commodities. The term "actual crop" refers to the amount actually grown in the year indicated, while the term "commercial crop" has reference to the quantity received at leading markets. The actual crop of a commodity is larger than the commercial crop in a season when part of the production is held back from the markets. The commercial crop is larger than the actual crop in a season when producers forward to the markets not only what they have grown in the same year but their carry-over from previous years. When writers refer to commercial crops they should make this point very plain, as otherwise readers naturally assume that reference is made to actual crops. This point is constantly ignored in articles about Egyptian cotton, thereby giving very wrong impressions as to the relative amounts produced in various years.

In analyzing cotton statistics, writers frequently make the mistake of confusing spinners' takings with consumption, or of assuming that exports are synonymous with foreign consumption. The term "spinners' takings" refers to shipments of cotton from the leading markets of the world to mill centers, while the term "consumption" indicates the quantity of cotton which the mills actually put into their machinery. Needless to say, the term "exports" means shipments across the boundaries or from the ports of this country to foreign countries. Spinners' takings may be larger or smaller than actual consumption, according to whether spinners are adding to or running down their mill stocks. Exports may be larger or smaller than foreign consumption, according to whether stocks at foreign ports and foreign mills are increasing or decreasing. Within the past month a leading newspaper of New England published an article which purported to give world consumption of American cotton during the first three months of the current season, computing it by adding exports to domestic consumption. The figures in this article were very misleading, as foreign takings figures indicate that foreign consumption has not been increasing, even though exports from this country have.

Limitations as Bases of Forecasts

It should be remembered, in using trade statistics, that, no matter how accurate and comprehensive they may be, and however skillfully they may be analyzed, they do not furnish a sure basis for predicting positively and infallibly what the future course of business will be. Business is influenced by numerous forces whose occurrence and effect cannot be definitely forecast by any analysis of trade statistics, no matter how scientific. Among such forces are the weather, politics, and the psychology of the business community. When these forces actually begin to operate they may be stated statistically and their effects may be measured statistically, but they cannot be definitely predicted by statistics.

To illustrate, it is impossible to predict with certainty the size of any given cotton crop on the first of July, August or even September, for droughts or rains on the one hand, or unusually favorable weather on the other hand, may subsequently reduce or increase the final outturn by a million bales or more. One cannot foresee positively what action our Government may take on such important economic questions as the bonus or tax revision, or what foreign countries may do in regard to such vital business problems as reparations, international indebtedness, and currency inflation. No one can predict with assurance to what extent the optimism of the business community in times of rising business or pessimism in times of falling business will affect demand and prices. Yet all of these factors greatly influence business conditions.

Economic Principles Govern

Perhaps the most important point to bear in mind in analyzing the statistics of any given trade is that they must be interpreted in the light of broad economic conditions and fundamental economic principles. It is not necessary for a business man to study the statistics of other industries in detail, but he needs to have a knowledge of general conditions in other business, based on statistical studies made by economic authorities. It must be remembered that conditions in any single industry are in large part determined by conditions in other industries, and conditions in all industries together are controlled by broad economic forces which produce alternately general prosperity and general depression.

This is particularly true of the textile industry, for the reason that it is a staple trade, supplying the necessaries of life to the great mass of people. When general business is good, the textile industry is usually prosperous. When general business is poor, the textile industry is usually depressed. At the peak of the 1919-1920 boom, when the manufacturing industries of the country were operating on an average of 115% of normal, the textile industry was running at about 120%. In the 1920-1921 depression, when manufacturing industries as a whole reduced operations to an average of about 72%, the textile industry curtailed to about 64%. In the 1922-1923 recovery, when the manufacturing industries at large increased their activity to about 110%, the textile industry increased to about 120%.

Similarly, in 1920, when the average price of all commodities soared to 247% of the 1913 price, Ohio quarter blood wool rose to 246%, fine staple Montana wool to 368%, and cotton to 342%. In 1921 and 1922, when the average price of all commodities declined to 138% of 1913, Ohio quarter blood wool dropped to 125%, fine staple Montana wool to 247%, and cotton to only 85% of the 1913 price. Neither cotton nor wool moved up and down by the same percentages as the average of all commodities, nor did either touch its high and low points at exactly the same time as the average of other goods. In their broad upswings and downswings, however, they both closely paralleled the general movement of all commodities, showing that they were all influenced by the same forces.

To summarize, then, it may be pointed out that in dealing with trade statistics "a little knowledge is a dangerous thing." Unless one makes sure that the statistics used are reasonably accurate, unless one analyzes them with relation to all factors entering into the situation, unless one allows for possible future developments, which cannot under any circumstances be forecast by statistical analysis, and unless one interprets statistics in the light of general economic conditions and broad economic principles, one should not use statistics at all. Statistics are of value only to those who have a sound knowledge of economics and who are constant students of business in its broadest phases.

Coolidge Will Succeed Himself

By *Charles E. Lord* *

I believe we have in President Coolidge a man who commands the respect of the country in the broadest, fullest sense. I think that that knowledge is penetrating more and more deeply day by day into the political consciousness of legislators in Washington and that in consequence the administration will be able to secure from Congress some important, constructive legislation, the beneficial results of which will be such as to make it apparent to all that President Coolidge will succeed himself. Under those conditions as they develop I see no reason to anticipate any adverse effect upon business from an impending presidential election.

As to "falling off in trade," is it not sufficiently accounted for in the instance of textiles by a producing capacity in excess of the country's need and inability to export on a large scale because of well known obstacles and increasing importation of manufactured goods (noticeably in cottons) and the caution occasioned by the high price of raw materials, a factor which can change suddenly with the possibility of inventory losses to those who have overbought?

Under such circumstances, the hand-to-mouth policy which is being pursued seems rational, even if it has been carried to some extreme, as I and many believe; and I regard it as entirely dissociated from politics at the moment. However, it is susceptible of becoming a very beneficial psychological effect by the enactment of any constructive economic legislation such as for instance, the recommendations of the Secretary of the Treasury in connection with a revision of taxation.

* Of Galey & Lord, Commission Merchants, New York.

A Coolidge Program Necessary

By *R. H. Wyner* *

I have always regarded it as a peculiarly unfortunate phase of our form of government that it is necessary for us to throw the country into the turmoil of a political campaign for the election of President, when there are no real issues to be faced. It is also true that in many cases when there are real issues to be faced, no election can be held to obtain real expression of opinion from the electorate. In this respect I think that the British form of government has one decided advantage.

To my mind the present year is a typical illustration of this fault in our government. I do not believe that there are any real issues; there are political issues such as the bonus for soldiers, the manufactured railroad issue, etc. On most of the outstanding problems there is a unanimity of opinion between both parties. However, since the Constitution requires it, there must be an election, and since there must be an election there may be a great deal of propaganda spread by the Outs to convince the public that they have great reason for dissatisfaction with the Ins.

If the political parties could act sanely for the benefit of the public, and accept the common sense program put forth by President Coolidge and Secretary Mellon, the year 1924 would be a rather good year for business in spite of the presidential election. But our faith in political parties must be tempered by our experience of the past, and judging by the past I am inclined to feel that sufficient unimportant or fictitious issues may be brought into the campaign to create considerable unrest and undermine the good health of business.

In case it is not obvious from the above, I might say that I am a strong Coolidge man.

* President, New England Div. National Knitted Underwear Asson., Stoughton, Mass.

Farr Alpaca Co. Completes Half Century

Organized in 1873 at Holyoke, Mass., by Company Which Had Been Operating in Canada, Concern Prospered From Beginning—Has Specialized on Cotton Warp Dress Goods—Develops Much of Its Own Machinery—Successful Labor Policy Has Been Important Feature of Its History

THERE is always so much live news to write about the Farr Alpaca Co., of Holyoke, Mass., that it may seem somewhat unnecessary to go back fifty years for a story.

A unique profit sharing plan; the largest new cotton spinning plant built in New England during the last few years; a pulverized coal installation—all these developments have

H. M. Farr. One of Founders of Farr Alpaca Co.

supplied real copy recently. However, the company has just closed a half century of such uninterrupted success as to warrant a review of its history.

One of the interesting features of its record is the fact that the Farr Alpaca Co. is an outgrowth of a Canadian industry. Its inception actually traces back to 1863 when Herbert M. Farr, a young man of 24, and his two uncles, George and Shubel Randall, all of Chesterfield, N. H., bought a saw-mill on the River Speed in Hespeler, Ont., and started the manufacture of knitted fabrics. They soon switched to the weaving of worsteds and in the course of 10 years found that Canada offered too small a market for their output.

As a result, they began to consider the establishment of a plant in the United States. Bellows Falls, Vt. was the first location selected but difficulty was experienced in interesting sufficient capital there. Finally they accepted an invitation from the Holyoke Water Power Co. to inspect a site in that city. For many reasons, one of which was that the water there was exceptionally good for dyeing and finishing, this locality was selected.

Early Financing

The next job was to raise money with which to finance the new project. And evidently this was no easy job. To many it seemed a "speculative" venture. Farmers from South Hadley and Granby, who incidently purchased a considerable amount of the stock, admitted in later years that they "kissed their money good-bye." But those who held on to it are today relieved of the necessity of working.

In the course of a few months, sufficient money had been raised to make a start possible.

Holyoke in those days was a town of some 15,000 people. Textile mills established there included the Lyman Mills, still in existence; Hampden Mills, now D. Mackintosh & Son's Co.; the Hadley Thread Mills and the Merrick Thread Mills, both now a part of the American Thread Co.; the New York Woolen Mill, owned by A. T. Stewart of New York; the Holyoke Blanket Co.; and Beebe, Weber & Co., men's wear fabrics.

Early Organization

On Nov. 3, 1873, the stockholders met at the Holyoke House (now the Hotel Hamilton) and elected the following directors: J. Beebe, J. C. Parsons, H. M. Farr, Anderson Allyn, Joseph Metcalf, George Randall and T. Merrick. The next day Mr. Beebe was elected president, and a building committee composed of Messrs. Beebe, Merrick and Farr was appointed. About the same time Joseph Metcalf, an Englishman who had gone to Canada when a boy and risen to the treasurership of the Great Western Railway, was induced by his brother-in-law, Herbert M. Farr, to join the new venture as treasurer. Mr. Farr himself became general agent.

The First Plant

With $250,000 capital paid in, the building started. A site was selected on Bigelow St., on land belonging to the Holyoke Water Power Co., together with four mill-powers (each mill-power being equal to about 63 h.p.). From the beginning, Mr. Metcalf urged the conservation of the company's working capital and advised against the purchase of a plant outright. Consequently an arrangement was made with the water power company whereby 10% of the cost of the plant was to be paid each year for 10 years—plus, of course, 6% interest on the balance. It is believed that this precaution saved the company from failure because many times in the early days their working capital was badly needed.

Early in March, 1874, the first wool was scoured and about the last of May, goods were shown on the New York market.

From the beginning, fortune seemed to smile on the new organization. Its product was well received, and even though its maiden year, 1874, was one of serious depression, a dividend of 10% was paid upon the capital invested.

The early product included seersuckers, matelasses, flannels, nuns' veiling, bunting, etc. One event of which the company has always been

Joseph Metcalf, First Treasurer of Farr Alpaca Co.

most proud happened only two years after the goods were first produced: It received a gold medal at the Centennial Exposition in Philadelphia and special mention from Henry Mitchell, president of the British Dry Goods Association, for "an excellent exhibit of black alpacas, mohairs, cashmere and serges—all of superior manufacture, very regular in quality, evenly spun, and of permanent color and finish."

Mill of Randall Farr & Co. in Hesperel, Ont., Parent Plant of Holyoke Firm

First Plant of Farr Alpaca Co. at Holyoke, Mass. in 1873

The best proof of the company's progress is its rapid increase in equipment. Starting in 1874 with 150 looms, it was found necessary to add 100 more in 1875, still another 100 in 1876 and 100 additional the following year. In 1878, increase in business demanded a further expansion, the total number of looms being brought to 725. Furthermore a line of coatings for men's wear was added to the company's product.

The events in the following years came rapidly. In 1880, the manufacture of coat linings was started in a serious way — and these constitute today about 60% of the company's product. In 1889, a separate finishing plant was established and 250

F. H. Metcalf, Present Treasurer of Farr Alpaca Co.

more looms were added, bringing the total to approximately 1,000. Since then, the entire plant has been practically rebuilt; in fact the present office building, erected in 1889, is the oldest of the group.

During those foundation years, a clean-cut financial policy was maintained by Treasurer Joseph Metcalf which accounted for much of the success of the company. One of his principles was: "Don't distribute all you earn." As a result a healthy surplus was continually piling up and this has served in good stead in many of the years of general depression which the company has weathered.

Changes in Personnel

There have been surprisingly few changes in the management personnel of the company. Joseph Metcalf continued as treasurer from the inception of the company until 1916 when he died and was succeeded by his son, Frank H. Metcalf, the present treasurer. The latter entered the mill in 1889 getting his early training in the machine repair shop and then going through the various departments and occupying the posts of superintendent of the dyeing and finishing plant, assistant agent, agent and finally treasurer.

Of the other original members of the firm, Herbert M. Farr died in 1900 and George Randall in 1904.

E. W. Chapin, the present president of the company, was elected to that post in 1894. He acted as clerk at the formation of the company and formerly had been Justice of the District Court in Holyoke.

A Set of Principles

This matter of personnel is no small one because in the character of the men who have guided the policies of the Farr Alpaca Co. is found the answer to its success. Treasurer Metcalf and his father behind him have built up a local reputation for honor and square dealing which explains the standing of the company in its own community. "If Frank Metcalf says it's so, it is so" is a truism in Holyoke.

Here are some of Frank Metcalf's manufacturing principles — as stated to a representative of TEXTILE WORLD:

"Place at the head of the various departments men who are of an inventive or ingenuous turn."

"Don't get too close to the wool market. Daily fluctuations tend to upset you and foreshorten your vision. I keep in touch with world conditions — the statistics of sheep production and other broad questions — but I go days without even knowing what price wool is quoted in Boston. Having my office at the mill instead of near Summer St. is a good thing."

"Never be forced to buy. Keep covered a year in advance; then you won't be under pressure at any time and will be able to replenish pretty near the bottom."

"The executive head of a manufacturing business should be a mechanical genius as well as a financial genius; he's got to talk the same language as the men in the shop who come to him for advice."

"Don't put too much stress on the initial cost of anything. Figure out what profit its going to bring you at the end of the year. In the same way, a wage scale means nothing; its what you're going to get for your payroll that counts."

"A business managed from an executive standpoint by one man has a better chance to succeed than one controlled minutely by three or more men."

Then and Now

Out of the practical application of such theories, there has developed the following metamorphosis:

Farr Alpaca Co.

	1873.	*1923.*
Capital	**$250,000**	**$14,400,000**
Looms	**150**	**4,000**
Employes * ...	**300**	**4,000**

*** It is interesting to note that in 1873 there were two employes for every one loom; today there is one employe for each loom. Mr. Metcalf points to this as an indication of what mechanical development and perfection has done in the textile industry.**

From a financial standpoint the mill paid 40% dividends for a number of years; then 24%; then (from 1914 to 1923) 8% — the change representing of course the increase in capitalization to more nearly represent the investment involved. Only two quarterly dividends have been passed in 50 years of operation — and those were in the very early days.

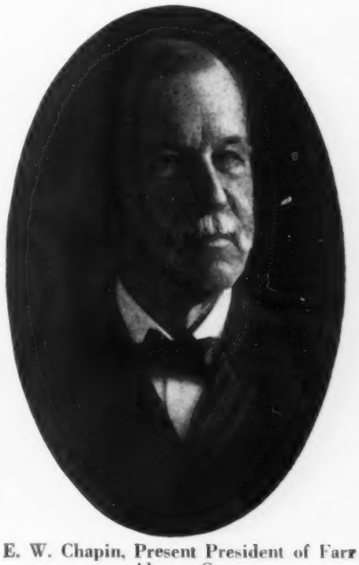
Miscellaneous developments which have been detailed previously in these columns include:

The erection of a cotton mill of 75,000 spindles for the production of the warps used in the company's product.

A shift to pulverized coal which is now under way and which, Mr. Metcalf states, will mean a saving of $100,000 a year.

A profit sharing plan which prior to 1923 involved the distribution of nearly $2,500,000 in nine years, and which this year brought the regular 8% and an additional anniversary dividend of 12% to the employes, despite the fact that the mill has averaged only 12 days of operation per month since July 1.

A pension plan which provides for an annual sum equal to 1% of the total earnings of the employe for 10 years preceding retirement, plus

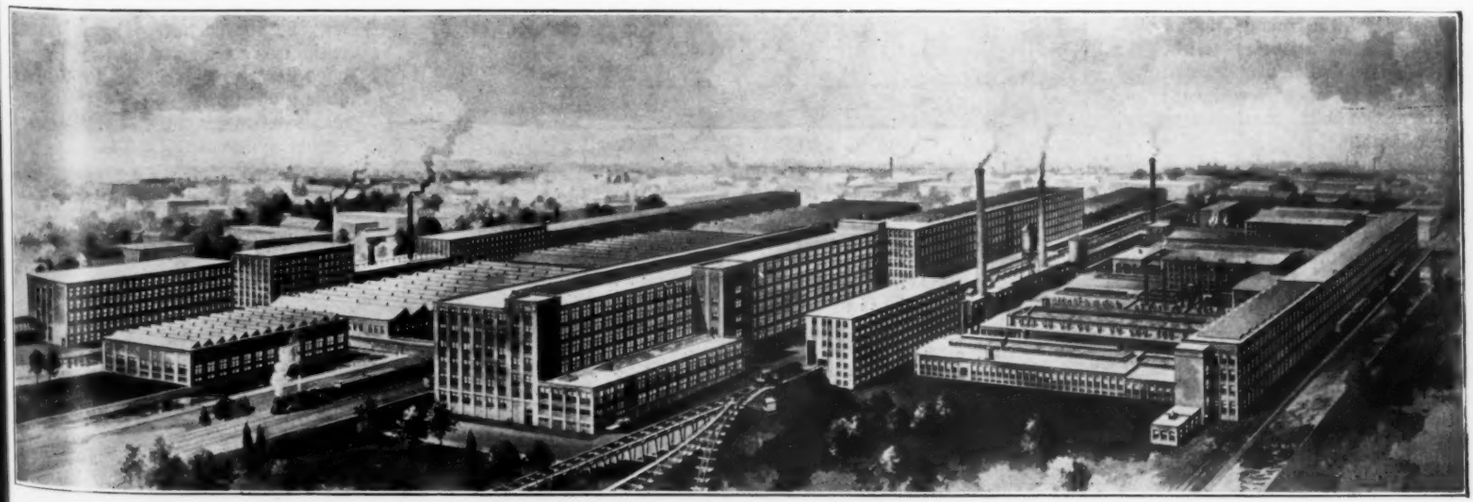


E. W. Chapin, Present President of Farr Alpaca Co.

10c. per week for every year in excess of 10 years of employment.

On such a basis has the Farr Alpaca Co. acquired the reputation of being one of the most efficiently operated textile mills in the country, while the stockholders have received steadily high returns on their investment and the employes have *earned*, not a living wage, but as much as the company could conscientiously pay them.

All of which would seem to represent a pretty good half century.



Present Plant of Farr Alpaca Co. at Holyoke, Mass.

American Cotton Textiles in World's Markets

Disappointing Total Sent Abroad During Year—Record of Great Britain's Export Losses of Little Comfort to Domestic Manufacturers—Increase in Imports Leads to Promise of Details on Merchandise Brought in—Effect of High Raw Materials on Business in Foreign Countries

By *Edward T. Pickard*, Chief, Textile Division, Department of Commerce.

UNMITIGATED retreat from the world's consuming markets seems to have been the fate of American cotton piece goods during the year 1923. The total export of all kinds of cotton cloth is not yet available for the full twelve months' period, but the first eleven months of 1923 show that nearly 117,000,000 fewer square yards were shipped abroad than for the similar period during 1922. On a percentage basis it reveals a decline from 1922 of 21% in our foreign outlets. Nor is this all, for the

E. T. Pickard.

1923 total will probably show the smallest yardage exported in a decade.

The real test of strength is on a quantity or yardage basis, and the showing in this respect is sufficient cause for lamentation. On a dollar basis, however, the first eleven months' shipments for 1923 were slightly over $73,000,000, but $5,000,000 short of the 1922 period.

England's Situation Analyzed

There is little consolation in comparing one's miseries with the plights of one's neighbors, but it may not be amiss to review hastily the condition of our chief competitor, Great Britain.

Although American exports during 1923 will show a very small yardage improvement over the year 1913, Great Britain has suffered a loss in her cotton cloth trade of more than 40% from 1913. For the first eleven months of 1923, she exported 3,818,000,000 sq. yds. as against 6,545,000,000 during 1913. It should be stated, however, that the eleven months' period of 1923 almost exactly duplicates the yardage shipments during the similar period of the preceding year. Probably the impelling factor in sustaining her yardage exports to the 1922 level was that Lancashire consistently sold cloths at below cotton replacement values, and found it expedient to sell at little or no profit rather than to further curtail production, or close down certain sections altogether. The loss suffered by adopting the policy of selling practically below cost of production was smaller than would have been suffered by additional restrictive production or shut-downs.

During the whole year of 1923, Lancashire has been consistently selling an average range of grey cloths at 9 to 19c. per lb. less than American mills charge for similar fabrics.

Then again, there is the problem of growing concern with respect to imports of foreign cotton goods into the United States. In unbleached cloths alone, the average monthly import for the first ten months was approximately 6,000,000 sq. yds., but November has outstripped the average for previous months by more than 50%, the total of such imported unbleached cloths being approximately 9,300,000 sq. yds. For the first eleven months of 1923, approximately 76,000,000 sq. yds. of unbleached cloth were imported, fully three times the total for the preceding year. The British policy of low selling prices appears to bear the greatest influence in the increasing import of cloths into the United States, as it probably also accounts for her better export record than the United States during the last year.

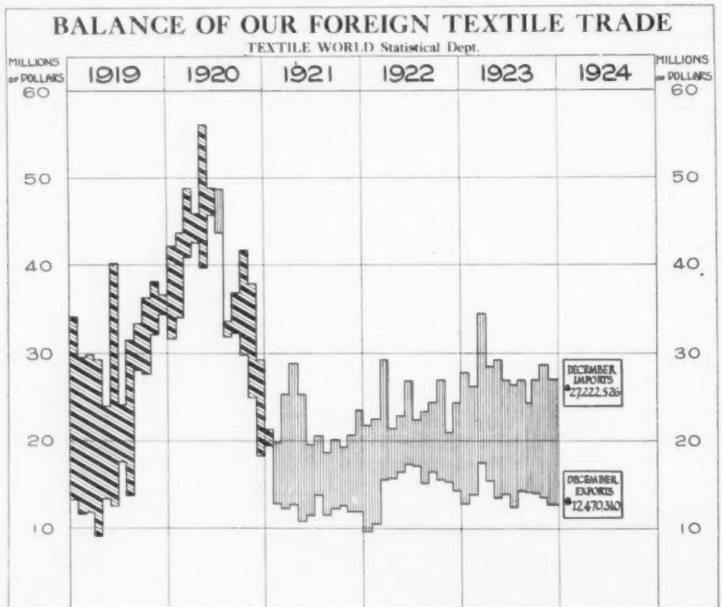
Import Details Promised

American manufacturers and distributors have heretofore been in the unfortunate position of not knowing the particular kinds or qualities involved in this import invasion, the monthly totals being shown only as unbleached, bleached and colored. A plan has been devised, however, under which it is expected that beginning Feb. 1, a comprehensive elaboration of cotton cloth imports will be given, so that American manufacturers will be in a better position to meet competition intelligently. Of course, the British situation affects our textile trade to a much greater degree than its relation to imports into this country. If England and the Continent can ship goods into the United States in competition with our own, their position is even stronger in the world's markets where they have been accustomed to trade for generations.

The world cotton situation and outlook in its production and consumption phases does not add much color to the picture. The high prevailing price of cotton has been an unmistakable deterrent to consumers of cloth. Prices prevailing today average 2½ to 3 times pre-war, but the purchasing power of consuming peoples in those sections of the world which use cotton cloth for clothing almost exclusively, has increased a maximum of 30% from pre-war. Until the ultimate consumer throughout the world is able to purchase more goods at prevailing prices, or until cloth prices are reduced to the level of the consumer's purchasing power, there does not appear to be any hope for radical changes in the outlook or for material betterment in cloth manufacturing centers throughout the world.

Undoubtedly the world is short of textile merchandise, and there are certain sections more prosperous than others to which America can sell goods of recognized quality. In such markets American merchants during the last year have met with the severest competition from England and the Continent, but distribution of a portion of the mill's capital with every yard sold cannot continue indefinitely. American merchants by careful study, aggressive and intelligent campaigns, and a will to follow through, can surely regain and increase their trade.

It is said that this country normally has an exportable surplus of 15% of her capacity production, but under present conditions we could afford to export 30% without putting the pinch on our domestic consumers. How shortsighted it is then for manufacturers and merchants to take the opportunist's view of the export outlet—a field to cultivate when goods may be spared but to be abandoned without consideration of consequences to producer and consumer alike, when the voice of local demand outranges the call for a steady export policy.



Good Economic Conditions

By *Stanley H. Wheelock* *

WHATEVER opinion has prevailed in the past regarding a presidential year being indicative of poor business, I do not feel that such is to be the case in 1924.

While it is true that many branches of trade are at the moment eagerly awaiting the developments of new business, I feel that the country is in a good economic position and that all lines of business will be in a better position during the next few months than they are today.

The people of the country as a whole have great confidence in the business sagacity of our President and they feel certain that the present Congress is going to do all that it can to reduce taxes and put business on a safe and sane basis.

* *President, Mfrs. Textile Assn.*

Announcing the Ford Textile Joke

A Technical Discussion of Some of the Developments Which May be Expected as a Result of the Jitneyzation of the Textile Industry—A Forecast and a Warning—What Others Think and What We Know—Read 'em and Weep—Or Laugh if You're a Friend of Ours

By *Jack Card*

THE earthquake and Henry Ford.

These two subjects comprise about all the possible copy which the year 1923 furnished us—unless we cared to discuss "North vs. South" and get ourselves into trouble.

Knowing even less about Henry Ford than we do about the earthquake, our journalistic experience impels us to choose the former. We have never interviewed the Jitney King; we have manipulated his product very rarely and even less skillfully; we never expect to have a chance to vote against him in a Presidential election; we know nothing about his textile plans outside of the publicity material released by his engineers and published in the widely-read columns of the well-known TEXTILE WORLD. Consequently, we are in an excellent position to discuss the gentleman and his works.

Personally, we welcome Mr. Ford into the textile ranks. We don't know why we do—but, then, many of those who took the opposite side apparently didn't have any reason for their stand either.

Possibly it's because, as a journalist, we regard the entrance of such a vivid personality as promising good copy. Textile manufacturers—as a class—do not fall in that category. This is said with all due respect to them. In fact, they are too eminently respectable. They never forget themselves so far as to launch a Peace Ship; to re-write American history on the witness stand; to become embroiled in a racial discussion. Consequently they keep out of trouble. But, incidentally, they don't get Presidential mention.

Now Henry is something else again. He would make excellent argumentative material for those who see no value in paid advertising. We suppose that if he were suddenly called upon to remit in full—at *Saturday Evening Post* rates—for all the free publicity he has received, he wouldn't have enough left to buy one of his own contrivances.

Advance Information

Out of the depths of our ignorance, we have tried to imagine—with a great deal of self-enjoyment—some of the upheavals in our industry during the coming Ford Era. We haven't got very far along in this game because we had to give it up to learn Mah Jong—but we want to go on record with this advance information in order to get credit when things start to happen.

Ford Textile Jokes

One of the outstanding effects, in our opinion, would be the creation of a school of textile humor. And who can point to any more crying need than this?

Take last year for example. Here's its product of jokes in our industry: The announcement from France that gland transfusion in sheep was destined to produce wool several yards in length. The erection of a new monument to the boll-weevil in the South. (*Note: This is a perennial.*) The Senatorial characterization of silk manufacturers by a legislator who got off on the wrong foot at a banquet. The national magazine write-up of the success attained by a famous manufacturer who a few weeks later was involved (slightly) in bankruptcy proceedings.

There probably are a few more, but we don't want to convulse our audience. Look these over and then think of the refreshing effect of several hundred Ford textile jokes.

One of these has appeared already—and it's credited to Henry himself. He is reported on good authority to have remarked: "If I went into the hosiery business, I'd manufacture one size only." That's efficiency for you. No complications in that plant. A million pairs of ladies' hosiery, size 9, a day—whether they're needed or not. But meanwhile create the demand. Develop a standard size foot in America! Just as Ford has standardized the expression of the drivers of his priceless cars as they honk past Packards, Cadillacs, et al. Nothing is impossible in this generation of standardization. This idea fits in exactly with the program of the Division of Simplified Practice of the Department of Commerce which is cutting out odd sizes in beds, candy-boxes, tooth-picks and other luxuries.

Of course the women of Chicago might object—but who are they to impede the march of progress?

Another One

Then there's the minimum wage joke. When Ford first started to make history, it was $5.00 a day. Today, that's a joke in itself. When he gets around to the textile industry, it will probably be $25 a day. But that's all right too. The more wages you pay, the more money there is in circulation; the more money there is in circulation the more goods are bought; the more goods are bought, the more work the mills have; the more work the mills have, the more wages they can pay. And so on—until something breaks.

Textile Service Stations

But all of this is as nothing compared with the possibility of Ford textile service stations. Here one's imagination can run riot.

A man's hip pocket breaks under the strain. No cause for worry. Anywhere along the road it may be replaced for 25c.—and no questions asked—whereas a Kuppenschaffner hip pocket would cost $4.50. Ask the Veteran Motorist—he knows.

Or else one's right foot is harder on hose than his left. If he's standard size—and he will be in time—he'll replace it for half the cost of a new pair.

Possibly carburetor trouble develops in the vest. Don't bother to get it repaired at $2.50 per hole. Buy a new part—No. AX 21,450—for $1.75.

The Political Angle

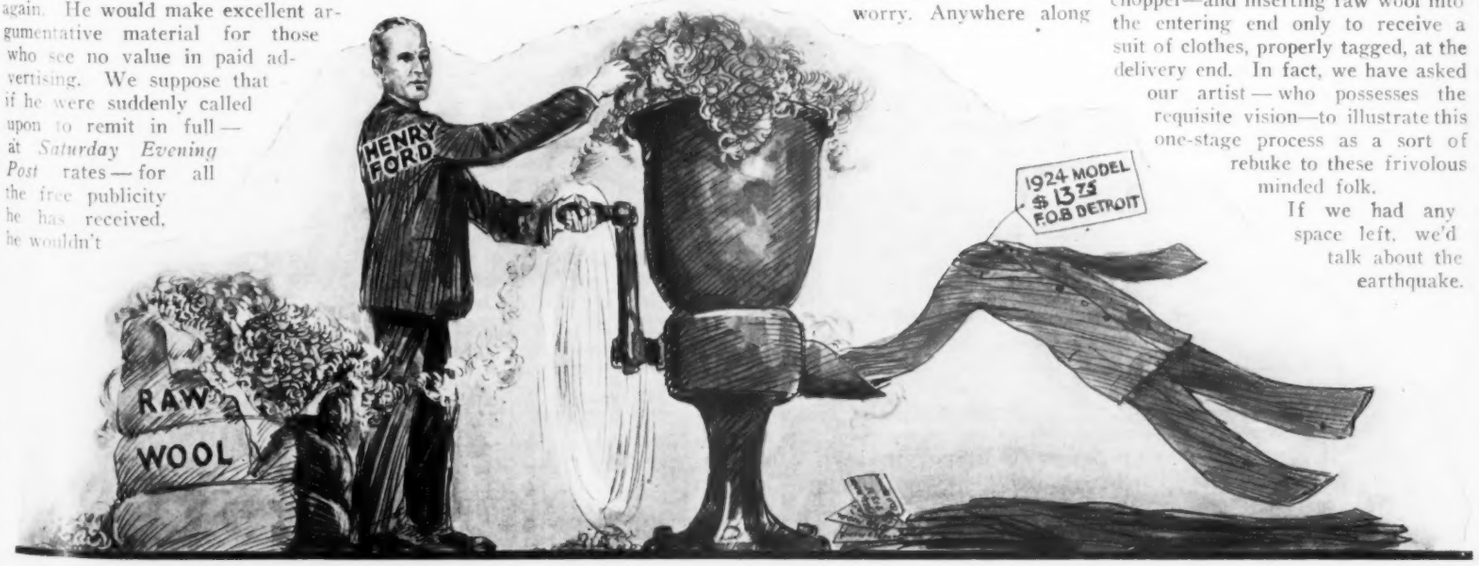
But that's not the half of it. Anyone who has read the columns of TEXTILE WORLD will realize that all the textile industry of New England needs is a friend at court—some legislator who knows what industry needs. That's easy. With a nucleus of 10,000,000—more or less—Ford drivers and an added increment of 100,000,000 clothing wearers—mostly more—the man who injected sanity into textile manufacture could be elected Czar of these United States with a 99-year lease. And then let the agitators rave.

An Explanation

We have been attempting to remain conservative in this forecast. The truth appeals to us—ever since we wrote the story of the new fibre made in Germany from nettles—and almost lost our job. Consequently, we have presented merely a thoughtful, sober story. But others, less hampered by experience, will no doubt be able to expand this subject, truth or no truth.

For instance, we have no doubt that a man with a fertile imagination could picture Henry Ford standing at a machine—much like a meat-chopper—and inserting raw wool into the entering end only to receive a suit of clothes, properly tagged, at the delivery end. In fact, we have asked our artist—who possesses the requisite vision—to illustrate this one-stage process as a sort of rebuke to these frivolous minded folk.

If we had any space left, we'd talk about the earthquake.



Blue Print Shows Continuity of Processes in a Ford Textile Mill.

The Reduction of Textile Payroll Losses

Vast Majority of Such Losses Traceable Directly or Indirectly to Unsound Motives of Employes—Quantity and Quality of Production Similarly Controlled—The Remedy Lies in the Constructive Encouragement of Sound Motives

By *John F. Sherman* *

THE purpose of this article is to treat of Payroll Loss as a factor in modern business, its prevalence in the textile industry, its relation to earnings and to stability, and to suggest a remedy.

Many employers think that wages control productive effort. This is fallacious because numerous employes who are getting a good day's pay are delivering from 25 to 50% less than a full day's work. Wages contribute but do not control.

It often works out that the more the employer pays, the less the employe delivers.

Other employers think that vocational skill controls productive effort, but this view is unsound, as there are many employes who are vocationally fit, but who are delivering from 25 to 50% less than a full day's work. Like wages, craftmanship contributes but does not control.

More Need of Motive-Study Than of Motion-Study

Some of the shortest producers are well-trained and competent in their vocation.

The factor which controls the productive effort of every worker is his Motive. If a man takes the life of another, the law recognizes that behind the act there was the impelling power of a motive, and the state will ascertain the motive for the act. But aside from matters governed by law, the existence and power of motives has been little understood. In industry the motives of workmen exert a tremendous influence for or against production, and are thus the root of vast losses on payroll investment which damage both employer and employe.

And yet employers pay little or no attention to the motives of their employes. In various plants considerable attention has been given to motion-study, but almost none to motive-study, although the motions of the workman are controlled by his motives. This is so vaguely realized by the average employer that the motives of the employes are antagonized instead of capitalized.

Three Types of Motives

Practical engineering analysis and experience show that every working-force is made up of three types of employes. This holds true regardless of size of plant, kind of product, location of the industry, open or closed shop, or any other condition. Not three types of employes by sex, race, creed, vocation or rate of pay, but three types as regards Motives: Conservative, Radical, and Neutral.

The proportions vary somewhat according to specific conditions, but repeated analyses indicate clearly that in any average one hundred employes, in any average factory, plant or mill, ten per cent are of Conservative motive, 10% are of Radical motive and the remaining 80% are of Neutral motive.

The 10 employes of Conservative motive produce a full day's work. There is no loss on their payroll dollar. But the 10 employes of Radical motive produce only about 50% of a day's work, and there is a loss of 50% on their payroll dollar. And the 80 employes of Neutral motive produce only 75% of a full day's work, with a resulting loss of 25% on their payroll dollar.

The net result, and this is a typical illustration, is a loss in productive value of 25% of payroll investment per 100 employes. Which is another way of saying that between a negative and a co-operative attitude of mind on the part of employes there is a difference in productive value of 25% of annual payroll investment.

How Motives Operate

To explain how motives operate, it may be said that an employe of Conservative motive is a 100% producer for the reason that he understands that it pays to apply himself loyally and diligently, and to deliver as much as possible to his employer. His daily production reflects co-operation, contentment and active Interest-in-the-Job.

An employe of Radical motive is a 50% producer for the reason that he believes that it pays to restrict his efforts and to deliver as little as possible. His daily work reflects antagonism, discontent and dislike of the job.

The employe of Neutral motive is a 75% producer because he believes that it pays to do just enough work to hold his job. His daily production reflects discouragement, lack of initiative and no Interest-in-the-Job.

Thus there is developed a situation which represents a loss of $25,000 on every $100,000 of payroll or a loss of $250,000 on every million dollars of payroll investment.

Some employers may feel skeptical of the possibility of sustaining such a loss, particularly if the mill is regarded as well-managed. But to lose money on payroll is easier than is commonly supposed, and such loss does not necessarily indicate poor management. For example 100 employes at $3 per day represent an annual payroll investment of $90,000. A loss of 25% would amount to $22,500 per annum.

This means a loss of $225 per annum per employe, or $4.33 per week, which equals 72c per day, or 9c loss per employe per hour.

Pay-Roll-Loss

Bear in mind that there are commonly nine sources or causes of Payroll Loss including the following factors: waste of time, waste of material, waste of machinery and equipment, waste of power, waste of supervision, absenteeism, labor turnover, under-production in quantity, and under-production in quality. Hence the hourly loss of nine cents per employe distributed into these nine factors, represents a loss, for each factor of loss, of only 1c per employe, per hour.

It must be apparent that when a plant is closed down by controversy, the loss is enormous. This fact is of vital interest to the textile employer for the reason that statistics now available indicate that the textile industry stands third highest in number of controversies in the United States, being headed only by the building trades, and by the garment industry.

In the present keenly competitive era, no business is so big or so successful that it can afford to ignore a loss of 25% on any million dollars of invested capital. There is no room nowadays in business for even a fraction of such a loss.

Its Costly By-Product

But Payroll Loss has a by-product which is more costly and dangerous than Payroll Loss itself. That by-product is Loss of Customers—a loss which cripples and endangers markets and distribution, and which is poison to the life-blood of any business.

That Payroll Loss directly and inevitably causes loss of market is clear from consideration of the nine sources of Payroll Loss, which include seven factors directly increasing the cost to make, and hence selling-price. Is there any quicker or more successful method of losing business today than by being obliged to quote selling prices which your competitor can beat? These seven factors of Payroll Loss have in thousands of instances nullified the most effective advertising and the most skillful salesmanship and merchandising.

Under-Production

Again, it will be noted that there are two factors of Payroll Loss which have a direct and vital bearing on the filling of orders, after the orders have been obtained by the sales department. These factors are Under-Production in Quantity and Underproduction in Quality. Does any manufacturer know a quicker or more effective method of losing customers today than by failing to make deliveries as per contract dates, or by shipping goods which are a little under the specified grade?

These two factors of Payroll Loss are the direct cause of loss in distribution in these days when the market for the product of the average concern is all too small and is steadily shrinking.

It is not too much to say that Payroll Loss, and the kindred loss of market, has been instrumental in bankrupting numerous companies in many fields of industry—and is now in process of bankrupting many more.

In view of these practical considerations, the direct relation of Payroll Loss to earnings and to stability is clear.

Some Results of Unsound Motives

Many employers have been blind to the fact that, basically, production is controlled by the motives of employes, also blind to the fact that an enormous loss per annum is accumulated from the apparently small loss per employe arising from such avenues as the following: a few minutes time lost by tardiness, loitering, or stoppage; a few ounces of material spoiled by carelessness; a few reeds, shuttles, or draw-frame rolls spoiled or broken; a few shovels of coal wasted; an occasional "dead" spindle, or cut of "seconds," or a warp re-drawn; yarn running half a number too heavy; cuts that are a fraction of a yard short; folders measuring a fraction of an inch in excess of a yard; a fractional error in moisture content—and numerous other items of loss due to carelessness, oversight, and Lack of Interest-in-the-Job, *all basically due to unsound Motives in the minds of the employes.*

In many fields of manufacturing just such insidious wastes and losses as these have eaten into profits to such an extent that there is only a fractional profit left.

It should be recognized that this condition is directly caused by Payroll Loss, which in turn arises from unsound motives in the minds of the employes. Such a condition is costly to the employe, as well as to the employer.

Things That Are Not Remedies

What is remedy for Payroll Loss?

It is not to increase the wages in

* President Sherman Service Company.

the mill. Even if that were feasible, it frequently turns out that when more is paid, less is produced.

It is not to increase the supervision in the mill. Beyond a certain point, supervision costs more than it is worth.

It is not to attempt to buy the employes through "Welfare." The average employe resents gifts from the employer.

It is not to depend upon legislation to control the situation. There are too many factors in legislation today to figure on.

It is not to wait for some other manufacturer to take the initiative. He always waits, too.

It is not to become discouraged over the changed conditions in the mill business. Some of the changes can be met successfully.

It is not to close the mind to consideration of ways and means, nor to insist on "enduring what can't be cured." A receptive attitude is a valuable asset.

It is certainly not to move the mill to some other section of the country. Most of the advantages hoped for will be found missing on re-locating, or shortly thereafter.

The Remedy Must be Constructive

The remedy for Payroll Loss (and the resulting loss of distribution) is to take constructive steps relative to the controlling factor, namely the motives of employes.

It is necessary that human motives be treated as actual and practical entities, the same as a human body; that these motives be accurately and fairly analyzed; that adequate treatment be devised; and that the treatment be so administered that it will be absorbed beneficially.

The object is to benefit the employe, as well as the employer. Both must benefit together, or neither one will benefit. Both are losing now, under the existing situation, and the real remedy must result in benefits to both.

Motives may appear to be intangible things, but the fact is that motives possess many very practical aspects. Every man has a motive and is controlled by it. His motive was not born with him. He acquired it. He acquired it from reading and from his associates, chiefly the latter in the average case.

Fundamentally, the employe is as much interested as the employer in the survival and the stability of the business. This is proved by the amount and the nature of the interest displayed by employes as soon as they begin to understand the real situation.

Importance of Employe

Due to the development of labor-saving machinery in the textile industry, the employe is now assigned to tend many times the former number of sides or looms. This has perhaps led to the conclusion on the part of some employers that, since the machinery requires so little attention from the employe, the employe is of small value or importance.

But exactly the opposite holds true, for if the employe now tends several times the sides or looms formerly tended, it is clear that the employer is dependent on the employe's care, interest, co-operation and loyalty for the return on a far greater capital investment in spindles and looms than before. The truth is that the value of the employe in the mill has greatly increased.

There is found in the textile industry the same viewpoint found in some other industries where production seems limited to speed of machinery, namely, that an increase of output cannot be had through the employes. But this overlooks entirely the fact that the machine that does not stop shows in the aggregate for more production than equipment subject to stoppage.

Must Make Motives Sound

The only way to keep stoppage of machinery at a minimum in any business is to man the machinery with employes of sound motives. They should be well-paid and of good vocational skill, but the factor of sound motive is vitally essential.

This has long since passed the experimental stage. In many industries, including textiles, there is ample experience to show that sound motives are a thoroughly practical asset, that they can be acquired, with great and immediate benefit to both employer and employe. And whatever benefits employer and employe is certain to benefit the community and the industry, thus contributing directly and materially to the general prosperity and stability.

The motive of the employe is the most neglected asset in the textile industry.

Position of Tire Industry in 1923

Statistics on Shipments, Production and Inventory in Both Cord and Fabric Tires

AN interesting statistical bulletin, showing relation of supply to demand, both in cord and fabric tires, was published recently by the Rubber Association of America. The figures given in this bulletin cover a period from September, 1921, to November, 1923, inclusive.

Study of the charts showing the position of shipments, production and inventories in the tire industry, shows that whatever further increase there is in fabric for tires is likely to be limited in the near future to cord fabric. In this field, however, the tire fabric industry is still suffering from the overproduction of tires and the consequent demand for fabric of last spring. Over a period of two years, however, cord tires have shown an increased consumption somewhat in proportion to the increase in car registration and to the consumption of gasoline. During the same period shipments of fabric tires have held practically on a level, but contrary to the large inventory which exists in cord tires, fabric tire inventories have been reduced to a point which promises a steady production in this field for spring business.

The amount of fabric to be consumed in both cord and fabric tires is open to question owing to the experiments which are being carried on in making tires with less cotton than was used formerly.

Explanation of Charts

The two charts reproduced herewith show the statistical position in both cord tires and fabric tires. The shading effect between the production and shipment curves draws attention to the important relation of production and shipments. The heavy shading shows that production exceeds shipments, while the dotted effect indicates that production is less than shipments. The cumulative effect of the shading is reflected in the changes simultaneously taking place in the inventory curves.

The lower section of each chart is designed to show to what extent the industry is stocked at the end of each month; that is the number of months' supply on hand to meet the average monthly requirements. The inventory at the end of each month is divided by the shipments for that month, and this gives us the number of months' supply on hand, assuming the shipments per month will remain the same. But because this value is quite changeable, three months' values are averaged to obtain a value that is a trend and a reliable indicator. This is what has been designated as the progressive average supply.

Cumulative Totals

The following table shows cumulative totals of production and total shipments for cord tires and fabric tires for the first eleven months of 1923, as compared with the same period of 1922:

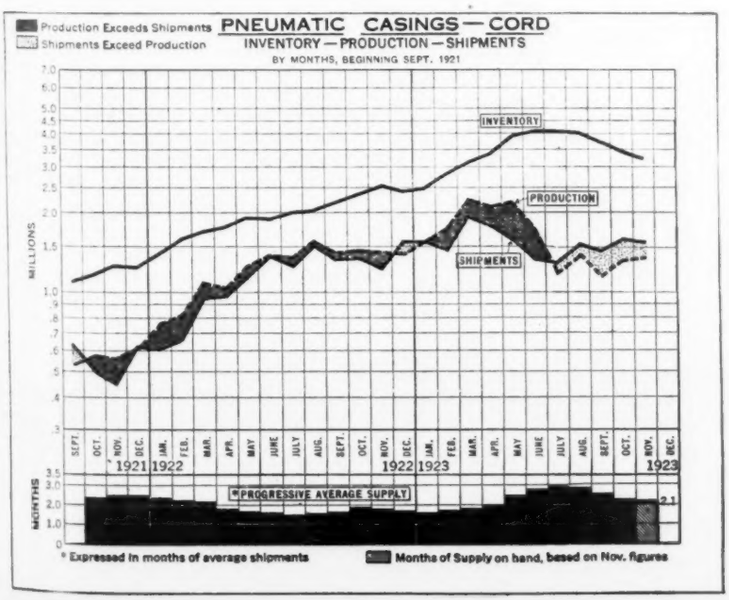
January Through November, 1923

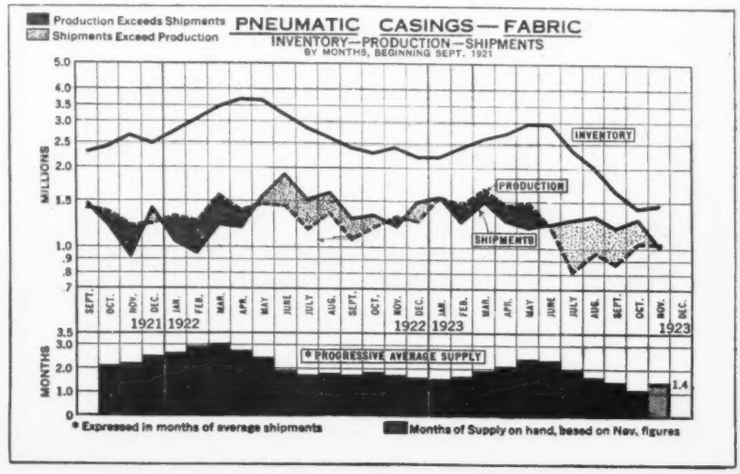
	Casings—Cord	Casings—Fabric
Production	18,037,725	13,466,499
Total shipments	17,119,688	14,113,471
*Excess (Prod. over shipments)	918,037 minus	646,972

January Through November, 1922

Production	13,273,092	14,500,195
Total shipments	12,273,220	14,678,016
*Excess (Prod. over shipments)	1,264,712 minus	174,821

* This is not the complete inventory, being only the difference between the inventory, as of January 1 and November 30, 1923.



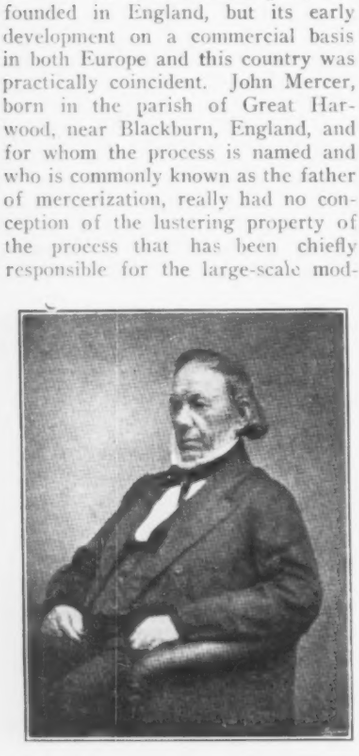


A Quarter Century of Mercerizing

Review of Early Patents and of the Experimental and Development Work of Pioneer Mercerizers in This Country—Its Expansion Into One of the Most Important Branches of the Cotton Industry—Reminiscences of Men Who Helped to Found the Industry 25 Years Ago

Compiled by *Charles H. Clark*

THE mercerizing industry, like the cotton manufacturing industry of which it is an essential part, was founded in England, but its early development on a commercial basis in both Europe and this country was practically coincident. John Mercer, born in the parish of Great Harwood, near Blackburn, England, and for whom the process is named and who is commonly known as the father of mercerization, really had no conception of the lustering property of the process that has been chiefly responsible for the large-scale modern development of this important branch of the cotton industry; Mercer mercerized without tension for crimping or creping and for increased brilliancy of dyed effects and increased strength of fabric. It is a fact, however, that cloth mercerization, as practiced by Mercer in the roller-cistern dyeing machines, then in use, could not fail to produce a certain amount of luster, as a result of the uneven tension between the rollers, and this fact makes it almost incomprehensible that Mercer did not discover this property of the process; a possible explanation may be found in the probability that only fabrics made of short cottons lacking natural luster were employed, or that the brilliancy noted in the dyed effects were credited to the combined effect of lustering and dyeing, rather than to mercerizing as it was known to Mercer. The fact remains that John Mercer died in 1866 without any conception of the enormous possibilities of his process for producing a silk-like gloss or luster.



John Mercer (From "Mercerization")

Second Important Step

Not until 1890 when H. A. Lowe, a Manchester, England, chemist, took out a second patent for causticizing cotton yarns and fabrics was the lustering effect of mercerizing under tension realized, and the real foundation laid for the modern mercerizing industry. Although Lowe's patent was to be declared basic by English courts in 1897, the German courts in 1901, and the American courts in 1906, there is little more evidence that this inventor had any greater conception of the possibilities of his patent for lustering than did Mercer regarding his patent of 1850, this being due to the fact that Lowe evidently applied his process to yarns and fabrics made from short staple cotton, thus producing insufficient luster to be of real commercial value. And it was not until 1895, when Richard Thomas and Emanuel Prevost, an enterprising firm of dyers in Crefeld, Germany, definitely established the value of mercerizing under tension for the production of luster, that Lowe and other chemists and men identified with the industry began to realize the potentialities of the Lowe patent of 1890.

Even Thomas and Prevost blundered upon this property of the process while attempting to develop a crimping or creping process that would evade the patented process of two Frenchmen, Garnier and Depouilly. Because Thomas and Prevost used fabrics made of naturally lustrous Egyptian cotton, and experimented with tension as well as without, they obtained a superior mercerized luster that could just as well have been discovered by Mercer and Lowe if the latter had processed fabrics of a similar character. Although the Thomas and Prevost patents were later declared invalid by the German and English courts, and eventually after long litigation by the United States courts, this firm of dyers progressed quite rapidly with the development of their process to the point where it was an acknowledged commercial success, and by 1897 they were mercerizing both yarns and cloths in considerable quantities, and in that year took out patents in England on yarn and cloth mercerizing machines.

While reports regarding their process and the effects produced by it began to leak out in 1895 sufficiently to cause finishers in England, France and this country to seek further information and attempt to duplicate the process, it was not until 1896 that any important headway was made by competing inventors and finishers. The year 1896 evidently marks the establishment of the mercerizing industry for luster on a commercial basis in Germany, and possibly in England, but it was at least a year or two later before mercerizing for luster was sufficiently far advanced in this country to be referred to as an industry or as a commercial success.

As it seems to be established beyond a question of reasonable doubt that experimental work of most of this country's pioneer mercerizers was completed by 1898, and that several of the yarn and cloth mercerizers were making regular deliveries in that year for the first time, the year 1898 then marks the establishment of the industry on a commercial basis. It is, therefore, fitting that the twenty-fifth anniversary of so important a branch of the cotton manufacturing industry should be celebrated. With the co-operation of living pioneer mercerizers, and the successors of those deceased, the salient features of those pioneer days in both this country and Europe are herewith presented.

While we have had the hearty co-operation of all those pioneer mercerizers who could be located during the brief period in which this series of articles was being prepared, it is unfortunate that some were away at the time and reference to their experiences is, therefore, necessarily brief and incomplete. Because such historical dates and data as are essential for a sketch of this character are seldom to be found in the office records and files of manufacturers, and because memories are not infallible, it will not be surprising if some of the dates and facts are found to be incomplete or not entirely correct, and we shall consider it a favor if more correct facts and dates can be supplied by those having definite knowledge of them. These addenda may be published at a later time when an attempt may be made to bring the history of mercerizing in this country up to date. In the present instance the limited space available makes it impossible to carry the story of mercerization beyond what may be termed "the litigational period," ending in 1906.

For co-operation in providing valuable material we are indebted to the pioneer mercerizers and firms whose accomplishments are recorded; also to Franklin W. Hobbs, president of the Arlington Mills, who kindly loaned a complete set of the testimony in the famous lawsuit of the American Mercerizing Co. Vs. Hampton Co. et al; also to the authors of "Mercerisation" a practical and historial review of the art, published in 1903.

Monument to John Mercer at Great Harwood, Eng. (From "Mercerization.")

Credit Where Credit is Due

Before considering in more detail the development of the mercerizing industry in this country it may not be amiss to attempt to evaluate the importance to the world industry of the discoveries of John Mercer, H. A. Lowe and Richard Thomas and Emanuel Prevost. Testimony brought out in the famous suit of the American Mercerizing Co. vs Hampton Co., F. Coit Johnson, et al. and designed to sustain the Thomas and Prevost patents for which the plaintiff company was sole licensee in this country, seemed to demonstrate conclusively that lustering of cotton yarns and fabrics would be an unavoidable consequence of processing of the right kinds of yarn and fabrics in certain dyeing machines utilized commonly during Mercer's lifetime, and actually used for this purpose in this country as late as 1898 and 1899. The fact remains, however, that Mercer was ignorant of this possibility of his process, and that he expected and deserves credit only for the comparatively limited accomplishments of mercerization as practised during his lifetime.

While the commercial advantages to date of the mercerization process of John Mercer are much more limited than those involved in mercerization for luster, as given to the world by Thomas and Prevost, there is no certainty that this will always be the case; for instance, there is excellent reason for believing that the possibility of the mercerizing process for increasing the strength of yarns and fabrics has never been fully realized, and that this either by itself or in conjunction with the lustering effect may be more adequately capitalized in the future. However that may be, the monument erected to Mercer by the identification of his name with the word universally used to designate the process is well warranted by his accomplishments, and forms a more adequate and lasting memorial than the monument that stands to his memory in Great Harwood, England.

Relative Merits of Patents

It seems apparent from the testimony brought out in the American Mercerizing Co. case, and in the decision of 1906 declaring the Thomas and Prevost patents invalid in this country, that if the Mercer patent of 1850 had been in force at that time it would have been equally as effective as was the Lowe patent in invalidating the Thomas and Prevost patents. It is true that Lowe specified tension on yarn and fabrics as an essential feature of his invention, whereas in Mercer's case it was merely an unavoidable result of the use of existent dyeing machinery while working the patent. Mercer probably would have discovered the lustering feature of the mercerizing process if he had utilized fabrics made of long stapled and lustrous Sea Island or Egyptian cotton. It was failure to do the same thing that caused Lowe to miss making his patent a commercial success. Apparently Lowe's chief claim to historical distinction in connection with the development of mercerization is the fact that his patent was declared basic by the English, German and United States courts, and that Thomas and Prevost thus missed the capitalization of their patents for a large fortune. A report of M. Prud'homme at the Paris Exposition of 1900 gives adequate credit to Thomas and Prevost, but seems unduly generous in its estimate of Lowe's contribution to the industry; it is as follows: "In all equity Lowe must be considered the author of the idea which consisted in preventing the contraction of the cotton, and on the other hand the merit of giving cotton the luster of silk with commercial advantage belongs incontestably to Messrs. Thomas and Prevost."

The Experimental Period

Reminiscence and Fact Regarding the Pioneer Work in This Country and Europe

THE history of mercerizing in this country, from its experimental stage to 1923 inclusive, may be divided logically into three periods: Experimental, 1896-99; Litigational, 1899-1906; Normal, 1906-23.

The beginning of the experimental period in this country is laid in 1896, because this is coincident with the beginning of experimental work in England and Europe, following publication of the Thomas and Prevost patent and dissemination of reports regarding their work and actual samples of the latter. As an actual fact, very little information about this discovery that was reliable, or based upon more than rumor, was to be found in the trade and technical press prior to the latter part of 1897, while TEXTILE WORLD and other trade papers of this country published little of importance before the early part of 1898. In the meantime Lowe had contested successfully the Thomas and Prevost patent application in England and his rights in that country had been purchased by the Germans, thus eliminating him from future mercerizing history as an active factor; in fact, there is no evidence that he ever mercerized for luster on a commercial scale.

It was through chemists and textile dyers and finishers of Germany, England and France who were experimenting more or less successfully along the lines of the Thomas and Prevost and Lowe patents, that chemists, dyers and manufacturers in this country were encouraged to commence experimental work along similar lines in late 1895 and early 1896. The exact dates of the starting of such work are of insufficient importance to warrant the painstaking and difficult research work that would be required to establish them beyond question of doubt, and remembrance of them by surviving pioneers and their descendants or successors is even more vague and uncertain than that of dates when deliveries of mercerized yarns and cloths on a commercial scale were started. That some of these pioneers may have visited England and Germany as early as 1895 and 1896 in endeavoring to secure definite information regarding the chemistry and mechanics of mercerization is seemingly well authenticated, but that other pioneers did not make such trips until 1897 or 1898 is also capable of proof, as is the fact that basic experimental mercerizing work was still in progress in this country and Europe up to 1900.

Early Yarn Mercerizing

It was not until German and English mercerizers in 1897 commenced to seek a market in this country for their products that a vigorous impetus was imparted to development work here by importers who offered substantial orders to those who could duplicate the luster of these goods — principally yarns. As was the case abroad the first demand for these came from the silk trade for warps, from thread converters and from upholstery and drapery manufacturers. Knitters were slow to adopt their use both here and abroad, because of the lack of elasticity inherent to mercerized yarns and also of satisfactory tension devices, and it was many years before knitters overcame their early prejudice and found methods of utilizing mercerized yarns in a large way.

Strange as it may seem to present-day manufacturers one of the earliest uses for which mercerized yarns were highly recommended was for spindle bands. It represented an effort to pioneer mercerizers to find an outlet for their "seconds" — yarns that were unsatisfactory in point of luster, but that had all of the enhanced strength of yarns satisfactorily processed. As might be expected, mercerized spinning bands seldom were re-ordered as their lack of elasticity rendered them even shorter-lived than the ordinary bands made of waste yarns.

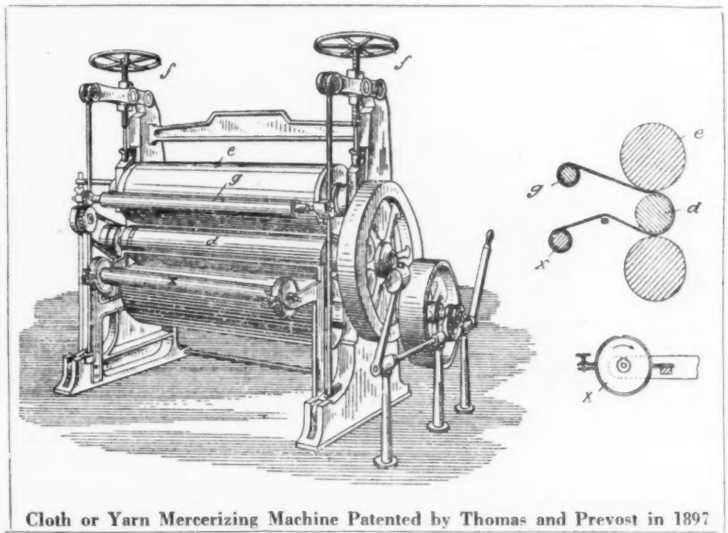
Early Cloth Mercerization

Although cloth mercerization was a little slower in gaining headway in this country than abroad this was due quite as much to the character of materials treated and to the relatively high cost of the machinery as to the ignorance of methods employed. The first yarn mercerizing was confined to skeins and it was a comparatively simple matter to rig up a small crude machine, and what was equally important to obtain the right kind of yarn for processing. Cloths woven of Egyptian, Sea Island and other long-staple cottons were comparatively common abroad, but few were properly constructed for satisfactory mercerizing. Furthermore, it was not at all generally understood that long-staple cottons of natural luster were necessary to produce satisfactory mercerized results, and it was not surprising that inventive effort should have been concentrated upon the production of a saleable luster upon goods woven wholly or in part of the shorter and cheaper cottons. When it was determined that it was the specular, or light-reflecting power of the glass-rod-like mercerized fibres that was responsible for their luster, and that a sateen weave approached most closely to the desired mirror-like fabric surface, it was but a step to the development of the Schreiner calender and its enhancement of luster on sateen faced fabrics.

For successful use the early Schreiner rolls required fabrics of considerable body, so sateen weaves with face of fine-count, long staple yarns and back of coarse, short-staple yarns were a natural sequence. Such fabrics being closer imitations of satin linings than any other silk fabrics that were popular in the late 90s, it was also natural that cloth mercerizing should have been concentrated upon such goods. This combination of cloth mercerizing equipment with Schreiner calender was sufficiently expensive to deter any but the largest finishers from embarking in an enterprise that was considered by many of questionable permanency, and that was not without danger of involving the mercerizer in expensive litigation. This leads up to, and tends to explain why, the earliest large demand in this country for mercerized fabrics was for lining materials, and also why those finishers who operated without Schreiner calenders were unable to meet cheap foreign and domestic competition, and were obliged to confine their efforts to lighter and finer linings, dress goods and shirtings. This, however, refers to a stage of development much beyond the experimental period in the history of mercerization in this country; in fact, Schreinering and mercerizing are two distinct processes, and it was not until many years later that Schreiner calendering was commonly employed in this country.

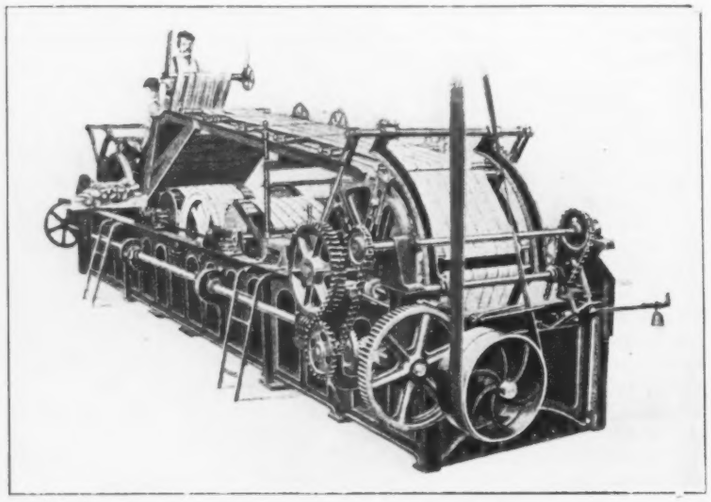
Why Skein Antedated Warp

That initial yarn mercerizing in this country and the experimental and inventive effort attending its development should have been confined very closely to the skein form, despite



Cloth or Yarn Mercerizing Machine Patented by Thomas and Prevost in 1897

the fact that American practice in yarn bleaching and dyeing involved the more economical use of the continuous ball or chain warp process was due to two essential facts: One is that the earliest successful German and English mercerizing machines were adapted for skeins and were copied or closely adapted by our pioneer mercerizers; another is that demand for mercerized yarns was confined to small lots at first, for



Unique Continuous Hank-Mercerizing Machine of Copley, Marshall & Co., Ltd., England, About 1900.

which the skein machines were best adapted. Incidentally it may be stated that early mercerizers who utilized warp machines produced far more seconds than firsts, with the result that the net cost per pound was little, if any, less than that of skein machines, while the average luster obtained was inferior.

Difficulty of Obtaining Data

Although some of the pioneer mercerizers, or their descendants and successors, who have been interviewed on the subject believe that experimental mercerizing was started prior to 1896, and in some instances was well established in the latter year, they admit in every instance that they are relying upon memory for these dates and have been unable to locate old records or papers definitely fixing them. One of the surviving pioneers who was under the impression, when first interviewed on the subject, that he had started experiments in 1896, and had visited England and Germany in the fall of that year to investigate the new process and machinery at first hand, finally located data that definitely established the dates of both in 1897. The son of another pioneer mercerizer, whose father had accompanied the gentleman just referred to on his trip to Europe, had been under the impression that the chronology of the father's initial venture in mercerizing started three years earlier than the date that is definitely fixed by the records of the European trip. There is nothing strange about such pranks of memory, nor do they reflect in any way upon the reliability of the vivid recollections of the same men of the details of processes and machines with which they experimented in those early days of the industry.

Experiments in U. S.

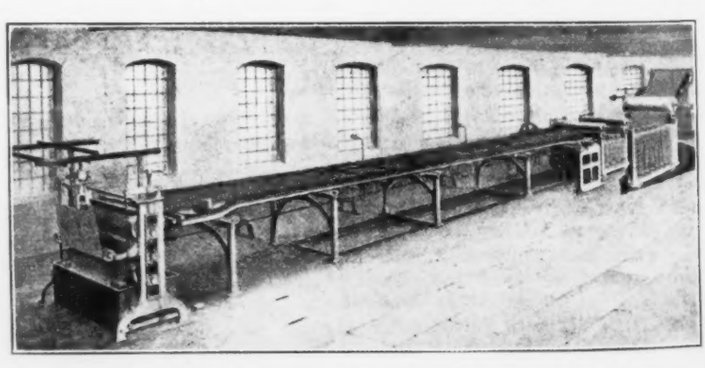
Strong circumstantial evidence that German and English progress in mercerizing had attracted little attention in this country prior to 1897 is found in the fact that, until well into the spring of that year there was no substantial progress in Europe to attract attention. Thomas and Prevost and one or two other German firms had been continuing experimental work and mercerizing for the trade in a limited way in 1896 and the same was true of a few English firms, but the industry was far from being established on a commercial basis. That did not occur in Germany and England until the spring of 1897, and it can hardly be said to have been established upon a fairly broad and permanent commercial basis in this country until early 1898, and that was just 25 years ago last year. There is well authenticated evidence that J. R. Montgomery & Co., Windsor Locks, Conn.; The Pennypack Yarn Finishing Co., and William H. Lorimer's Sons Co., Philadelphia, and the Aberfoyle Mfg. Co., Chester, Pa., were mercerizing skein yarns in a limited but satisfactory manner early in the summer of 1897, and that Jos. Bancroft & Sons Co., were experimenting with cloth mercerizing. It was not until after John Bancroft of the latter firm returned from Europe in the fall of 1897 that they commenced to make regular deliveries of mercerized cloths on contract. The J. R. Montgomery Co. still retain their 1897 records showing deliveries starting in June, 1897, to several firms who later became competitors in the mercerizing business.

A Cause for Secrecy

Most of these pioneer mercerizers designed their machines and built them in their own shops and this was true of some of the firms starting in the business later; in fact, a few have continued the practice. By so doing they hoped to keep secret certain features of the machines and processes that they considered important, and some of them went to the further extreme of taking out no patents either in this country or in foreign countries. As partial explanation of this secrecy of pioneer mercerizers, and builders of mercerizing machinery in this country, it should be recalled that, from 1896, when Thomas & Prevost applied in England for their second patents there was almost constant litigation in England and German courts to establish priority of invention, together with injunctions and threats of injunctions against mercerizers who were claimed to infringe, until 1898, and 1899 to 1906 there was the same deterrent to the ultimate exploitation of mercerizing machinery and processes in this country as a result of the suits and injunctions of the American Mercerizing Co., in their effort to establish the Thomas & Prevost patents as basic. Therefore, what we have termed the experimental and litigational periods in this country were really coincident, and this litigation was responsible for restricting the broad early development of the industry.

Early American Patents

The incompleteness of patent office classifications would render it a task of great magnitude to prepare a chronology of all mercerizing process and machinery patents, and in view of the general character of this article, the task has not been undertaken. In the work on "Mercerization" published by the editors of "The Dyer and Calico Printer," London, in 1903 a chronological list of English patents connected with mercerization was prepared, and in this list appear only two patents that can be definitely identified as of American origin. The first was taken out in 1898 by Thomas McConnell, W. T. Galey, and J. Hope, all of whom were identified with the Aberfoyle Mfg. Co., Chester, Pa. Thomas McConnell was the company's boss dyer at that time, J. R. Hope was boss machinist and W. T. Galey was the president and manager. It involved a hank or skein mercerizing machine, having transverse overhanging frames carried by the main frame and combined with a power-driven roller and loose rollers with adjustable bearings, the whole range frame resting on the lye vat and it being possible to give any desired degree of tension to the yarn. The other patent was granted to F. Coit Johnson, assignee of Thomas McConnell in 1900 and covered the hank mercerizing machine with which the Hampton Co., Hampton, Mass., started business, and that was the basis of the suit brought against that company by the American Mercerizing Company. Views and description of this machine are given in connection with the review of the American Mercerizing Company case.



Piece Mercerizing Range Made by Mather & Platt, About 1900.

Chronology of Early Patents

What appears to be a complete chronology of mercerizing patents taken out in this country prior to January 10, 1899, was published in the February issue of TEXTILE WORLD of that year. It includes nine patents, all but two of which were foreign. The dates of issue and brief descriptions follow:

July 20, 1897; Joseph Weiss, France. Creped effects produced on fabrics or yarns of vegetable origin by printing a resist on portions of the yarn or fabric after treatment in an alkaline solution and prior to neutralization and contraction.

December 28, 1897; Carl Tubbe, Germany. Fabrics padded with a mixture of lyes and colloidal agents are passed between heavy squeeze rolls, then rolled up and finally washed and neutralized.

March 15, 1898; Richard Thomas and Emanuel Prevost, Crefeld, Germany. Two patents, 600,826 and 600,827, which are described elsewhere and which were purchased later by the American Mercerizing Company.

September 13, 1898; Alfred Wyser, Switzerland. A hank mercerizing machine that had an adjustable reel, revolving on its axis in a vessel provided with a sprinkling device.

November 29, 1898; Emanuel Prevost, Crefeld, Germany. This covered a process supplementary to that of the first two Thomas and Prevost patents, and involved the application of pressure to yarns and fabrics during the time between putting them into the mercerizing liquid and the washing, and was supposed to give a more permanent and increased gloss.

December 27, 1898; James R. Hope, Philadelphia. A hank mercerizing machine provided with a main frame.

having one or more overhanging supports, extending along the sides, and having attached thereto a power-driven roller and one or more loose rollers. When the frames containing the two sets of rolls had been filled with skeins, and the loose lower rolls had been adjusted to secure the proper tension, the carrying frame was lowered into the vat and the skeins rotated until sufficiently impregnated.

December 27, 1898; Henri David, France. A suction or vacuum method of impregnating cloth with the mercerizing liquor while the former is being tentered.

January 10, 1899; H. W. Butterworth, Philadelphia, cloth mercerizing machine. Endless chains, provided with pins or clamps, hold the lateral edges of the fabric while the latter is carried over and under suitably arranged guide rolls, successively through baths of alkali, acid and water, stretching both warp and weft ways being prevented by the endless chain.

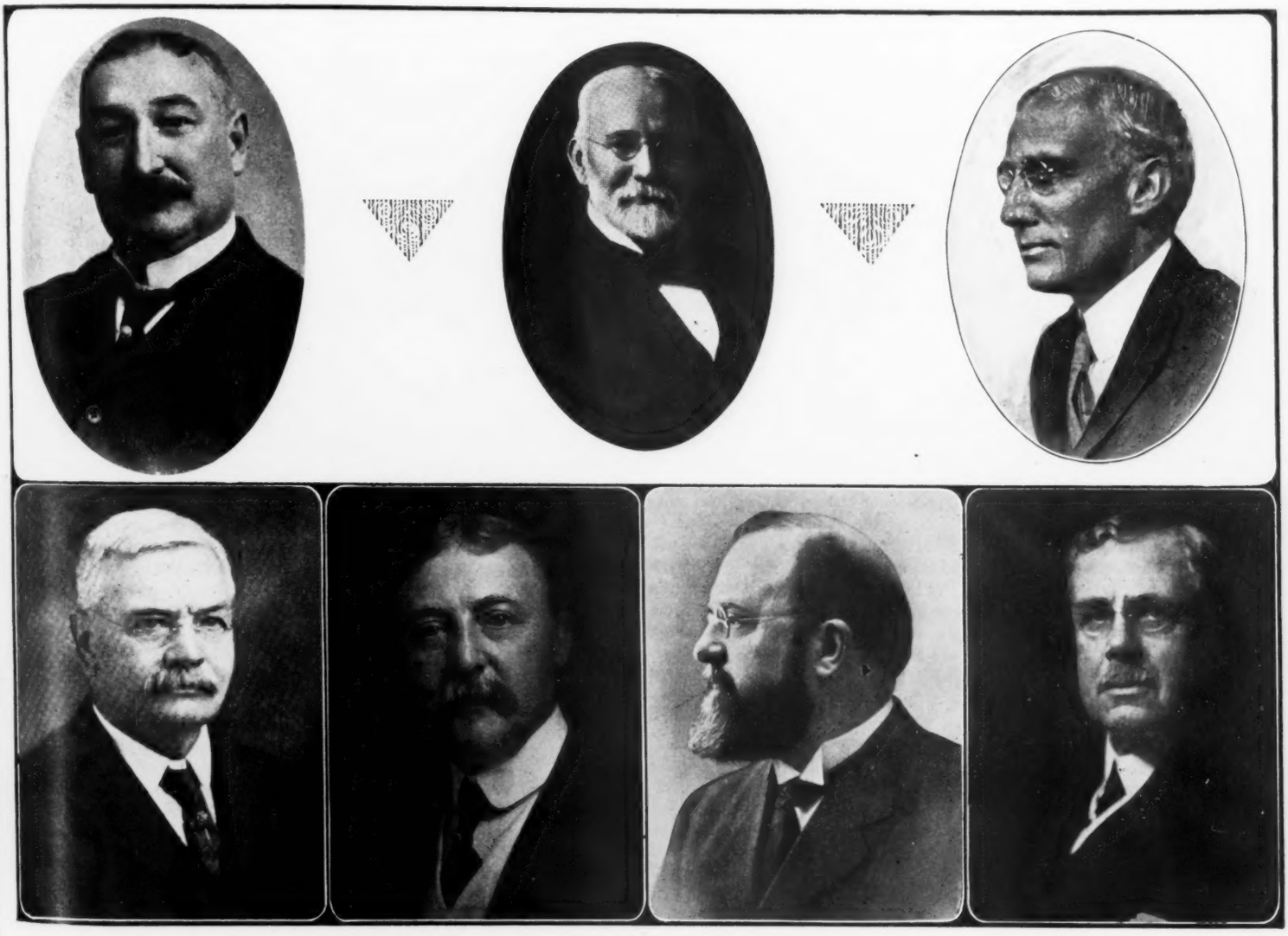
Contributions of Machine Builders

The machine builders who brought out the first mercerizing machines in this country where H. W. Butterworth & Sons Co., and the Lorimer Machine Co., Philadelphia, the Textile-Finishing Machinery Co., Providence, R. I., through their predecessors, the Granger Foundry & Machine Co., and the Rusden Machine Co. The important part that has been played by machinery builders in the development of the mercerizing industry will be explained in more detail in another chapter, but it may not be amiss at this point to state that while most of the pioneer yarn mercerizers preferred for reasons previously noted to confine their initial experiments and efforts to skein mercerizing machines, the machinery builders early visualized the fact that large production could be secured by processing the yarn in warp form and in a range, or continuous set of machines. The first yarn mercerizing machine built by H. W. Butterworth & Sons, Co., in 1897 was of this type. Although the first piece mercerizing machines were of a crude type as compared with the modern ranges of large producing capacity, nevertheless they were of the range type, and capable of more economical operation than the average foreign piece mercerizing machines of that date. Had the industry in its early days been freer of litigation and had there been closer co-operation between manufacturers and machinery builders, there is little question but that progress in economical warp and piece mercerizing would have been more rapid, and that its establishment on a stabilized or normal basis might have been advanced at least five years.

The Pioneer Mercerizers of 1898

Reminiscences of Firms Which Were Then Processing Yarns and Cloths on a Commercial Basis

WHILE the mercerizing industry in this country may be said to have been firmly established on a commercial basis in 1918, both as to volume and quality of yarn and cloth mercerizing, quite a number of firms were still operating in an experimental way, while piece mercerizing and yarn mercerizing in warp form were still in their infancy. Mercerized yarns and cloths were now being imported in considerable quantities, from England and Germany, and their prices were so low as to make it difficult for domestic mercerizers to compete at a profit. An inadequate tariff and failure of customs appraisers to classify mercerized yarns and goods as having been advanced beyond the grey state, added to the difficulties encountered by domestic mercerizers. Neverthelss, some importers gave domestic mercerizers the preference, in order to secure more certain deliveries, and there was steadily increasing demand from weavers for yarns and from converters and other buyers for mercerized piece goods. G. S. Lings & Co., New York, was one of the importers who encouraged domestic yarn mercerizers to increased



PIONEERS OF THE U. S. MERCERIZING INDUSTRY

Top Row (Left to Right)—Henry C. Forrest (Deceased); John H. Lorimer (Deceased); H. W. Butterworth. Bottom Row (Left to Right)—J. R. Montgomery; W. T. Galey (Deceased); W. D. Hartshorne; John Bancroft.

efforts, and Fred Butterfield & Co., Lesher, Whitman & Co., and Burton Bros. & Co., New York, and William Simpson, Sons & Co., Philadelphia, were among large early purchasers of mercerized cloths. The principal demand for yarns came from the silk, upholstery, and thread trades, and that for piece goods, from the lining trade.

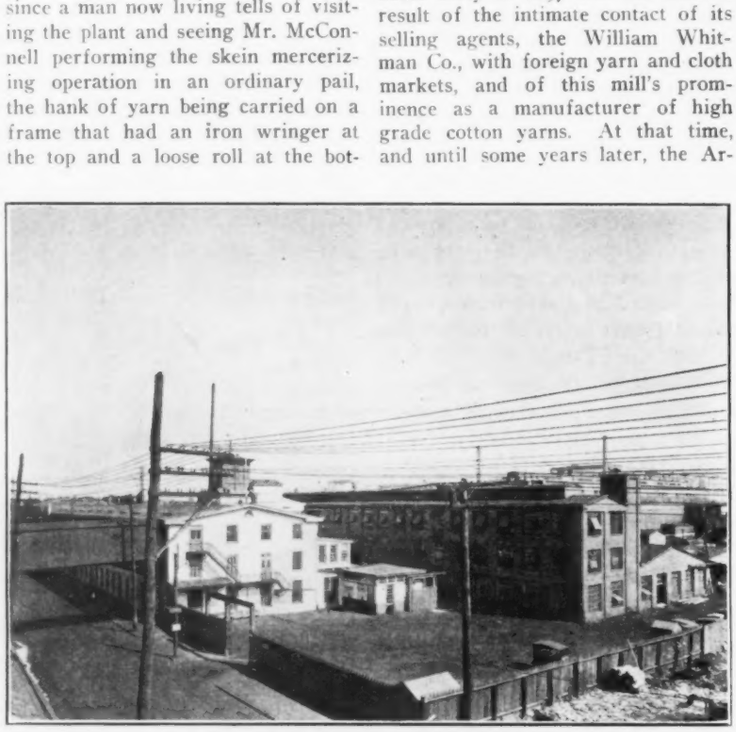
There were at least two cloth mercerizers who were operating on a commercial scale in 1898, these being John Bancroft & Sons Co., Wilmington, Del., and Frank A. Sayles, proprietor of the Sayles Bleacheries, Saylesville, R. I. Reliable records covering the list of yarn mercerizers operating at that time upon a commercial scale is somewhat more indefinite, but that it covers the following firms is well-established; Aberfoyle Mfg. Co., Chester, Pa.; Arlington Mills, Lawrence, Mass.; Gerald Cooper Co., Providence, R. I.; Greenwood & Bault (Globe Dye Works) Philadelphia; Kerr Thread Co., Fall River, Mass.; Wm. H. Lorimer's Sons Co., Philadelphia; Pennypack Yarn Finishing Co., Holmesburg, Pa.; J. & P. Coats, Ltd., Pawtucket, R. I.; Clark Thread Co. and Clark Mile-End Spool Cotton Co., Newark, N. J.; Indian Orchard Co., Indian Orchard, Mass. Although mercerizing has not in all cases remained a major part of the business of these firms it is an interesting fact that every one of these pioneer mercerizing firms is still in existence, either under its original title or in the form of a direct successor. The two Clark thread companies were absorbed in 1899 by J. & P. Coats, Ltd.; the Kerr Thread Co. in the same year by the American Thread Co.; the Arlington Mills cotton department, which was mercerizing in 1898, was re-incorporated as the Acadia Mills a few years ago; the Forrest Mercerizing Co., Gloucester City, N. J. is the direct descendent of the Pennypack Yarn Finishing Co., which was established by the late Henry T. Forrest and his son, Edwin Eyre Forrest, also deceased.

Aberfoyle Manufacturing Company

The first American patent for a mercerizing machine, and also the first British patent for a mercerizing machine invented by an American, were taken out in December, 1898, by William T. Galey, then president and manager of the Aberfoyle Mfg. Co., Chester, Pa., Thomas McConnell, then boss dyer for the company and James R. Hope, its master mechanic. It represented an improvement on the rather crude hank mercerizing machine previously used by the company, and the U. S. patent office issued the patent in December 27 of that year. The Aberfoyle Mfg. Co. at that time had a capital of $300,000 and operated 530 looms on fine cotton goods, also doing its own dyeing. It had the same officers as the Galey & Lord Mfg. Co., which was later absorbed, and Charles E. Lord was treasurer of both companies and is now president of the consolidated company. Both William T. Galey, Sr., and James R. Hope are deceased and Thomas McConnell left the company late in 1899 to organize the Hampton Co. in conjunction with F. Coit Johnson of J. H. Lane & Co., New York City.

The exact date at which the Aberfoyle Mfg. Co. started its mercerizing experiments has not been located, but it was certainly as early as 1896, since a man now living tells of visiting the plant and seeing Mr. McConnell performing the skein mercerizing operation in an ordinary pail, the hank of yarn being carried on a frame that had an iron wringer at the top and a loose roll at the bottom, the tension being regulated by a set screw at the top of the wringer. While the skein was revolved it was given successive baths of caustic, water, acid and water, all in the same pail. With the co-operation of Mr. Hope, the machinist, and under the supervision of Mr. Galey, mercerizing was then started on a commercial scale with skein machines built at the plant that were somewhat crude prototypes of the machine patented in 1898. Most of the yarn first mercerized was used in the company's own mills, but that some of it was sold is recalled by the man who remembers Mr. McConnell's early mercerizing experiments, and he states that some of the fine counts brought as high as $2.00 to $2.50 per pound.

The company became one of the licensees of the American Mercerizing Company in 1899, and William T. Galey was one of the directors of the latter company. Warp mercerizing was early undertaken and the growth of the company's business from the start was rapid. Since Charles L. Gilliland became treasurer its mercerizing business has had an even greater growth, and the company is now operating four modern warp mercerizing machines and one skein mercerizing machine which, on a day-shift, will give a weekly production of approximately 450,000 pounds, thus making it the largest yarn mercerizer in this country, and probably in the world.



Plant No. 2 of Aberfoyle Mfg. Co., Chester, Pa.

The Arlington Mills (Acadia Mills)

The inauguration of experiments in mercerizing at the Arlington Mills early in 1897 was the natural result of the intimate contact of its selling agents, the William Whitman Co., with foreign yarn and cloth markets, and of this mill's prominence as a manufacturer of high grade cotton yarns. At that time, and until some years later, the Arlington Mills operated both cotton and worsted departments, the cotton department and mercerizing plant being later incorporated separately as the Acadia Mills. In 1897 William Whitman was treasurer of the Arlington Mills, Franklin W. Hobbs, assistant treasurer, the late Robert Redford, agent, and William D. Hartshorne, superintendent of the worsted department. The latter's training as a chemist had much to do with the success of the early experiments in mercerizing in co-operation with John R. Ecob, who then had charge of the company's dyeing and is now one of the proprietors of the Westmoreland Dye Works, Philadelphia. The facts that we are able to give regarding early mercerizing at the Arlington Mills have been collected by these gentlemen and J. Earle Parker ,treasurer of the Acadia Mills, and John T. Mercer, present agent of the Arlington Mills.

Various experiments in skein mercerizing were tried out earlier in 1897, but it was not until September of that year that they started to build their first skein mercerizing machine, and it was not until December of that year that they made their first sample deliveries of mercerized skeins and warps, the latter having been processed in a two-box warp-dyeing machine that had been re-equipped for this purpose. The only important additions to the latter were some tension bars, for the purpose of keeping the warps as taut as possible when going through the caustic bath, and some cleats that were fitted over the ends of the immersion rolls to keep the latter in place. After the warps had passed through the caustic and acid baths of this machine they were taken to a four-box warp-dyeing machine and treated again with acid and then with hot and cold water until free of all caustic soda. Prior to this, and to the delivery of sample yarns to outside firms, warps had been mercerized for the use of the Arlington Mills as decorations in dress goods, and it was largely because of the satisfactory character of these yarns that they were encouraged to seek outside work. The first deliveries in December were of 40s-2 and 20s-2 Sea Island yarn, all but one of the lots being skein mercerized, and to the following firms: Folwell Bros. & Co. and Wm. H. Horstman, Philadelphia, Pa., Howard Mfg. Co., Charlestown, Mass.; Charles A. Brown, Troy, N. Y.; and the U. S. Bunting Co., Lowell, Mass. Later production covered a wide variety of counts from 16s to 80s but was confined almost wholly to yarns spun from Sea Island cottons. The first skein and warp machines were of small capacity, but a skein machine having a capacity of 600 pounds a day was soon installed and later a warp mercerizing machine furnished by H. W. Butterworth & Sons Co., Philadelphia, having a capacity of about 2,500 pounds per day of 10 hours. By April 1898 monthly production was ranging from 5,000 to 15,000 pounds and production records for the twelve months ended November 30, 1898, show that over 65,000 pounds had been delivered. Little trouble was experienced in producing a satisfactory mercerized yarn, but some of the peculiar chemical problems encountered are described by William D. Hartshorne in another article.

The Gerald Cooper Co.

The Gerald Cooper Co., Providence, R. I., started experiments in mercerizing in 1898 under the direction of Gerald Cooper, Sr. After laboratory work had demonstrated that the process was feasible the business was started with a small skein mercerizing machine having a capacity of about 200 pounds a day. The first work was for some of the local bleachers and dyers. Demand soon increased and additional improved machines were installed, all of which from then until the present day have been built in their own plant. G. A. Cooper states that they have had no difficulties to contend with since the initial experimental

plant was completed, and that except for the problems of doing the work in a larger way, reducing the cost of operation and perfecting some of the mechanical details of the machine, there have been very few changes in the process.

R. Greenwood & Bault

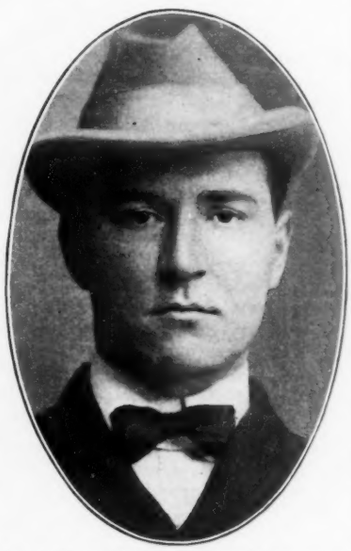
According to H. T. Greenwood, Jr., of the Globe Dye Works Co., successor to R. Greenwood & Bault, the latter firm started skein yarn mercerizing in 1898, the plant being located on its present site at Kinsey and Worth Sts., Frankford, Philadelphia. The members of the firm at that time were John T., Daniel R. and Horace T. Greenwood. Their attention had been drawn to the possibilities of mercerizing in 1897 when they received from one of their customers a 10-pound lot of mercerized yarn to be dyed. This was the product of a German firm, and it was thought that the luster would disappear when the yarn was dyed. This proved not to be the case, and as a result this firm began investigations and experiments that resulted in the development of a machine that mercerized one skein at a time. The price charged for mercerizing was 25c a pound, whereas it cost about 50c a pound for processing. For the purpose of increasing production and decreasing costs, machines of increased capacity were produced, first one of 10 pounds, then of 25 pounds and finally of 50 pounds. The only serious difficulty recalled by Mr. Greenwood that was encountered in this early mercerizing was that the machines were not strong enough and were comparatively short-lived.

The William H. Lorimer's Sons Co.

The first mercerizing experiments made by the Wm. H. Lorimer's Sons Co., Philadelphia, were conducted in 1896 by Walter A. Lorimer, the first practical results being obtained September, 1897, on skein yarns, and by the beginning of 1898 they were making regular deliveries both of purchased yarn and yarn furnished by customers. These facts were furnished by Joseph H. Lorimer, general manager of the present company, and he states that a visit to Europe in the fall of 1897, for the purpose of investigating available mercerizing machinery and visiting plants that could be seen, decided him and his associates, including the late John H. Lorimer, then president of the Lorimer Machinery Co., that an adaptation of his patent dyeing machine would be the proper machine for mercerizing. His letter of advice crossed one containing similar information from the home office and noting that they had a machine in operation as described. It is an interesting coincidence, that John Bancroft, then superintendent of Joseph Bancroft & Sons Co., Wilmington, Del., who was in Europe at the same time and for a similar purpose, and visited several foreign plants with Mr. Lorimer, also had his letter of recommendations crossed by a letter from the home plant noting that they had completed a piece mercerizing machine along the lines recommended by Mr. Bancroft.

The first Lorimer machine was for skein mercerizing and had a capacity of not more than 150 lbs. a day. This was built by the Lorimer Machinery Co., as have been all machines used by this mercerizing company since it started business. Excepting for mechanical improvements their skein mercerizing machine of today is the same in principle as that built late in 1897. Shortly afterwards they developed a warp mercerizing machine, which is still being used in addition to the larger warp mercerizing machines of the same principle that have been built since then.

The company's plant has always been located at Ontario and Lawrence Streets. The nominal original capital was $20,000. The officers were as follows: President, John H. Lorimer; managing director, Joseph H. Lorimer; directors, the former and Walter A., E. D., and Hugh K. Lorimer. Their first deliveries were made to local upholstery and hosiery manufacturers, they being one of the first mercerizing firms to interest the latter class of manufacturers in the use of this new product.



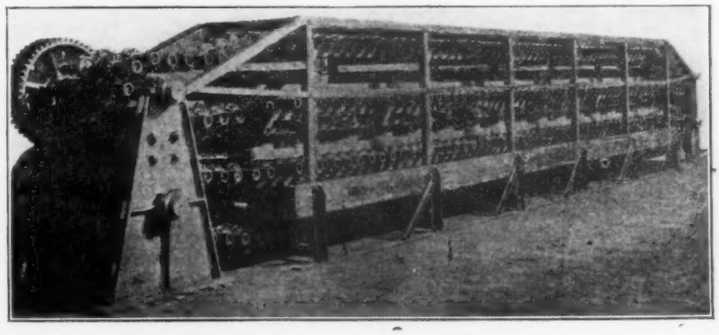
Edwin Eyre Forrest, Deceased, Pioneer in Mercerizing with Pennypack Yarn Finishing Co.

"When we made the first experiments," said Mr. Lorimer, "we felt there was a big future for the improvement in appearance of cotton yarns due to this process, and for many of its other advantages which have since proved to be correct, but we were looked upon as rather visionary and many people said it would only be a 'flash in the pan' and would soon die out. There were many conflicting views prevailing at the time regarding the process, and much mystery. Many contended that the caustic bath should be kept ice cold, and our first experiments ranged from that to the boiling point. We did not see that the results warranted putting in a refrigerating plant or using ice, and we started with a normal temperature and have used it ever since. We had great difficulty in getting properly made yarns that would give the desired luster and obtained the first good results from yarns made by the Willimantic Thread Co. The Globe Yarn Co. at Fall River made many experiments with gassed yarns but the theory they worked on in obtaining the proper single and ply we had to combat and finally got them to make what we wanted. They appear to be about the only plant having a gassing plant available at that time and our best results in gassed yarns was from those furnished by them on our description."

John H. Lorimer, president of the Wm. H. Lorimer's Sons Co., and the Lorimer Machinery Co., was president of the American Mercerizing Co. and his firm was one of its licensees.

Pennypack Yarn Finishing Co.

The Pennypack Yarn Finishing Co., Holmesburg, Pa., which was one of the pioneer mercerizing plants, was established largely as a result of the enthusiastic experiments in mercerizing that had been conducted by Edwin Eyre Forrest, who died a few years later at the early age of 27 years, in which experiments his father, Henry C. Forrest, then president of the Tacony Iron & Metal Works, became deeply interested and aided his son in starting a small experimental mill. Three other sons of Mr. Forrest, Henry C., W. Wendell, and Richard D., were also identified with the company and later with its successor the Philadelphia Mercerizing Co., Kensington, Philadelphia, to which the Holmesburg plant was moved in 1900, and also with the Forrest Bros. Co., which was later started in Tacony for warp mercerizing. Henry C. Forrest Sr., passed away in April, 1910, but the surviving sons have continued the business in which this family were pioneers and the Forrest Mercerizing Co., Gloucester City, N. J., whose modern plant was started in 1922, is the direct successor of the Pennypack Yarn Finishing Co., of the late '90's. Henry C. Forrest, president of the Forrest Mercerizing Company, was our authority for the following facts regarding the equipment and experiences of the Pennypack Company.



Continuous Skein-Mercerizing Machine ("The Oceanic") Invented by Henry C. Forrest, Sr., and Frank Schuman.

The skein mercerizing machine first installed was indeed very crude, consisting of an angle-iron frame, approximately 10 feet square. In the center of this frame was arranged a series of spools attached to sliding arms, a beveled gear connecting with each spool, the skeins extending from spool to spool horizontally. The sliding arms were pressed down to produce tension on the arms and when the rack was filled to its capacity of approximately 10 pounds is was lowered into a shallow tank containing caustic soda. A hand wheel, centrally located on the shaft, connected with the beveled gears, was then revolved until the yarns became thoroughly mercerized. The rack was then raised by means of a chain block and moved over to a drain, and hose was applied until the yarn was thoroughly washed. After washing, the spools were again contracted and the skeins taken off and placed in the dye box containing a dilute solution of muriatic acid, after which they were again washed, dried, and were then ready for the market.

While this machine was crude in its conception, the principle involved led to the working out of plans for a new machine under the supervision of Frank Schuman, vice-president of the Tacony Iron & Metal Works, and a mechanical genius. In co-operation with Henry C. Forrest, Sr., a machine was developed that consisted of an endless-chain system of sliding spools and racks, placed one behind the other and resulting in what is claimed to be the first continuous skein mercerizing machine. Excepting for the loading and unloading of the racks, the operation of the machine was quite automatic, the sliding arms being pressed down and the tension applied automatically. The racks then moved into and through a trough of caustic soda, thence to a washing compartment, after which the sliding arms would be released automatically and the yarn taken off and soured in open dye boxes, all of the necessary handling being done by boys. The original machine was about 140 feet long and because of its unusual size was nicknamed the "Oceanic." Despite its large size this machine was lacking in strength and capacity, and two ma-

chines were later built along improved lines by H. W. Butterworth and Sons Co., and were installed in the plant of the Philadelphia Mercerizing Co. The last machine built in 1907 had a capacity of from 7,500 to 10,000 pounds of skein per day of 10 hours. The improved machine was 48 feet long, 5½ feet wide and 7 feet high, and weighed about 100,000 pounds. Two of these machines were sold to the Kerr & Hoeggner plant of the British Cotton and Wool Dyers Association, Manchester, England.

While the development of this machine occurred at a much later period than the one under review, it is of interest as indicating the rapidity with which the industry developed and machines were improved, and also as reflecting the broad vision of the pioneers who had the courage to invest in this new industry. Although modern development of skein mercerizing has been along somewhat different lines, Mr. Forrest, Sr., studied it with one conviction that has been at least partially realized, and that was to the effect that in future years the largest spinners would be their own mercerizers. This was the objective toward which he and Mr. Schuman were working in the development of their continuous skein mercerizing machine with its relatively large capacity and its requirement of little and unskilled attendance.

Mr. Forrest states that most of the yarns mercerized in the late '90's were taken by the weaving trade in skein form, and that the price of mercerizing was in the neighborhood of 40c. a pound. He also comments upon the difficulty that he encountered in endeavoring to interest knitters in mercerized yarns. Most of the latter would have nothing to do with it because of the claim that the elasticity had been entirely stretched out of the yarn in mercerizing, and that a stocking made of such yarn would lose its shape and appearance when once worn. While knitters eventually were forced to recognize that prejudice was unwarranted, and this branch of the textile industry became one of the largest users of mercerized yarns, it is somewhat interesting to note that the present Forrest Mercerizing Company specializes on the production of mercerized single yarns for knitters, and particularly for plaiting and splicing.

The J. R. Montgomery Co.

One of the pioneers in the development of the mercerizing industry in this country was J. R. Montgomery of the J. R. Montgomery Co., Windsor Locks, Conn. Started in 1871 for the production of cotton warps, this company saw at an early date the possibilities in the manufacture of novelty yarns and rapidly developed that phase of their business to the exclusion of staples.

Naturally the news of a process for imparting luster to cotton was a matter of great interest to a novelty yarn manufacturer. Mr. Montgomery recalls the first information which came to him on this subject. He was in the office of Cheney Bros., silk manufacturers of South Manchester, Conn., in the early part of 1896 when Frank Cheney remarked to him: "Have you heard about the English adaptation of the old Mercer process by which cotton is made to look like silk?"

Mr. Montgomery hadn't but he immediately began to investigate. He found a clipping from an English paper, explaining the new method. With the aid of his dyer, he started a series of experiments in his mill. They first used a reel with iron spools on which the yarn was wound, and then immersed in caustic at the ordinary room temperature. It was immediately washed — and then soured and washed in succeeding operations.

After more than a year of endless experiments, the company realized the production of mercerized yarn on a commercial scale. Their books show sales in June, 1897 to the William Clark Co., Westerly, R. I., and in July 1897 to the Arlington Mills, Lawrence, Mass.; the Willimantic (Conn.) Linen Co.; and the Clark Mile-End Spool Co., E. Newark, N. J.

The machine for mercerizing these yarns was designed and built in the company's own shop—as in fact has been all their mercerizing machinery since that time. Their first commercial warp machine involved the winding of the chain around a friction roll, such as used in the beaming room; heavy tension was applied as the warps passed into the caustic box beneath. They were washed and then batched.

For a long time the successive operations of souring, washing and drying were separate steps and involved batching up each time. Gradually, however, the company developed a continuous process which reduced cost and increased speed very considerably.

While the warp mercerizing machine was being perfected, a skein equipment was also developed in the shop and put into actual use.

Mr. Montgomery recalls the fact that he presented a paper on mercerizing before the fall (1898) convention of the New England Cotton Manufacturers' Association and that at that time many manufacturers present had not even heard of the process, while the majority were not conversant with its details. His paper aroused so much interest that he was flooded with requests for samples when he returned to his plant.

At that time, the prospects for the job mercerizing business on a large scale appealed to him. The charge for the mercerizing was 40c. per lb.; competition was limited, and the field appeared in every way attractive. But as many more firms started mercerizing, and, with the mechanical improvements and increase of productive speed, the price of job mercerizing gradually dropped to 25c. and then much lower, its attractiveness faded. Mercerizing soon became to the J. R. Montgomery Co. largely an incidental process in their production of novelty yarns — and such it is today.

Mr. Montgomery tends to belittle the obstacles and difficulties which had to be met and overcome in those pioneer days of mercerizing. "Anyone could have done it," he says modestly, "the fundamental principle is an extremely simple one and just needs the application of a little mechanical ability. The most important element is the kind of yarn you use as a base. You can't get a superior luster on carded yarns, no matter how perfect your machinery is or how careful you are in your work. The best results are naturally on Sea Island and Sak cotton—and lower grades will give a less satisfactory product. Mercerizing was a romance to me in its early days but now it's only an incidental phase of manufacture."

To him the growth of the novelty yarn business in this country has been far more romantic. From the little wooden building they had when they started in 1871, the company has grown steadily until it now occupies a modern manufacturing plant and employs about 500 people. George M. Montgomery, brother of John R. Montgomery, joined the company in 1875 and it was incorporated in 1881. Its range of products is extremely wide, one of the most important features being tinsel products. "There is real romance for you," remarked Mr. Montgomery, "tinsel yarn was used in King Tut's day, 3,000 years ago."

Pioneer Southern Mercerizing Co.

That F. P. Bacon, president of the Southern Mercerizing Co., Tryon, N. C., was the pioneer mercerizer in the South appears to be uncontested, and it is a distinction of no small importance to have been the first to visualize the possibilities of the very large branch of the industry that has been developed in the southern states within the last fifteen years. Mr. Bacon started mercerizing in 1909, in a shed adjoining the hosiery mill located about two miles from the town, operating only one machine and turning out about 100 pounds of yarn a day that was used entirely by the hosiery mill. Later the hosiery plant failed, but Mr. Bacon continued to conduct the mercerizing business and gradually developed a considerable market in the southern territory. A plant that he built in the center of Tryon was soon outgrown and a new modern plant on the outskirts of the town was established in 1919. As recently as 1921 the capacity of the mill was doubled and it now has four skein mercerizing machines capable of producing 25,000 pounds of single yarn per week. It employs about 200 hands, as compared with the six or seven with which mercerizing was begun. The company has always made a specialty of single mercerized yarns for hosiery splicing and plaiting, and its capacity on this class of work is among the largest in the country. Ply yarns in fine counts are also mercerized and the company is equipped for gassing, bleaching and dyeing. W. C. Ward, former sales manager for the company, was admitted to a partnership interest in 1922 and since then has had charge of the manufacturing end of the business.

The Sayles Bleacheries

For the following interesting but somewhat incomplete facts regarding the identification of the late Frank A. Sayles with the early history of piece mercerizing in this country we are indebted to H. P. Reno of the Sayles Finishing Plants, Inc., which include the Sayles Bleacheries and the Glenlyon Dye Works where their first mercerizing machinery was installed:

"In the spring of 1898 the late Frank A. Sayles purchased in England the right to use in America the process for mercerizing covered by the famous Thomas and Prevost patents, and at the same time purchased the machinery needed to carry out this process from Ferdinand Mommer & Co., Barmen, Rittershausen, Germany. Some of this machinery was received in the early summer of 1898, a mercerizing calender being specifically mentioned.

"In February 1899 the 'new finish' had developed to a point where it was necessary to begin work on a mercerizing building. The first goods mercerized by us were finished in July, 1898. Our first production records are for August, 1898, and they show a total production for that month of 69,735 yards. Production records for September and October are 119,433 yards and 110,120 yards respectively. This entire production went to Burton Bros. and Lesher, Whitman & Co., New York City, and it is probable that both of these firms received deliveries practically simultaneously. Other finishers soon began to do mercerizing and suits for infringement were set up by the foreign owners of the Thomas and Prevost patents, who were unable in the litigation which followed to maintain their patents.

"For the first few years the process of mercerizing as carried out here was as follows: The padding machine was driven by a steam engine and cloth was run through the pad and batched on the top roll, then lowered to the front of the machine and run through a second time. Caustic soda was used at about 48 degrees Tw. and an ice chest was used to keep it cool. Fresh caustic was carried in a storage tank and then pumped through a series of coils in the ice-chest to two mixing tanks from which it ran by gravity to the caustic pad. In the summer of 1899 one tip-cart was kept busy all day hauling ice from the ice-house to this ice-chest. After the cloth had been padded the rolls were taken to the mercerizing frame and washed while under tension. Mercerizing was originally applied to

linings and sateens made of Egyptian cotton. These were high-grade, well-made fabrics and yielded a very fine luster."

Joseph Bancroft & Sons Co.

When first news of the new adaptation of the Mercer process came to this country, and samples of the lustrous product from Germany and England were received, the firm of Joseph Bancroft & Sons Company, Wilmington, Delaware, naturally became interested in the development at once. John Bancroft, present president of the company, who was at that time superintendent, went to Europe on September 1st, 1897, and investigated the process and the equipment used.

Before leaving this country he had started a series of experiments in his own plant which occupied his time during the summer of 1897. Working with H. W. Butterworth & Sons Company, of Philadelphia, the Bancroft firm installed a piece mercerizing machine.

In recalling those early days in an interview with a representative of TEXTILE WORLD, Mr. Bancroft admitted that the experimental work involved a great deal of difficulty, particularly in perfecting the mechanical phases of the operation for the increase of speed and quality of work.

The first frame used was a pin frame, but this was unsatisfactory and the pins were replaced with clips. From a mechanical standpoint, these were a great improvement, but water marks developed on the goods around the clips. To remedy this, Mr. Bancroft and those associated with him devised a rubber scraper to prevent the collection of water. Later compressed air was used to blow off the collected water.

Another difficulty that arose was the fact that the brass clips, which were used at first, were attacked by caustic; consequently, these were replaced later by steel clips.

The goods which were treated at Wilmington in the experimental stages of Bancroft's mercerizing department were principally of sateen construction, and were largely for Fred Butterfield & Company, of New York, and William Simpson, Sons & Company, of Philadelphia. For quite a while the production was confined to one machine, which was not fully employed.

At the time of the first mercerizing work, the officers of the company were: Samuel Bancroft, Jr., President; William P. Bancroft, Vice-president, and Henry B. Thompson, Treasurer.

Although started as merely one phase of the company's finishing business, the mercerizing department has grown steadily until today it contains nine modern machines, operating practically day and night.

The present officers of the firm are: John Bancroft, President; Joseph Bancroft, Vice-president; John Macadam, Vice-president, and R. O. Cooke, Treasurer.

One of the most significant advances made in the company's finishing process during recent years has been the development of the "Basco" finish, which is employed exclusively on damasks made by the Rosemary Manufacturing Company, and on other lines of goods.

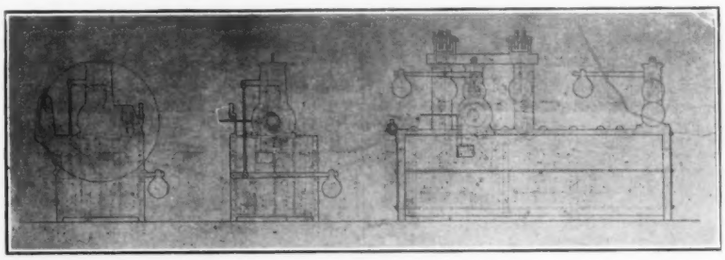
Machinery Development

Brief Review of the Important Contributions to Industry of Domestic Builders

FUNDAMENTALLY, the process of mercerizing is the same today as in its early stages 25 years ago. Developments since then have been along the lines of mechanically perfecting the eqpiment and processes in order to increase speed and improve quality of production. Consequently the part played by the mercerizing machinery manufacturers in the development of the inductry deserves prominence in any review of progress made.

H. W. Butterworth & Sons Co.

One of the firms which has been identified with mercerizing since the first German machines were brought into this country is H. W. Butterworth & Sons Co., of Philadelphia. Working with the mills themselves, this company has been constantly active in the developing and perfecting of the needed equipment.



Sect. A. Sect. B. Sect. C.

Fig. 1. Diagram of First Butterworth Warp Mercerizing Machine.

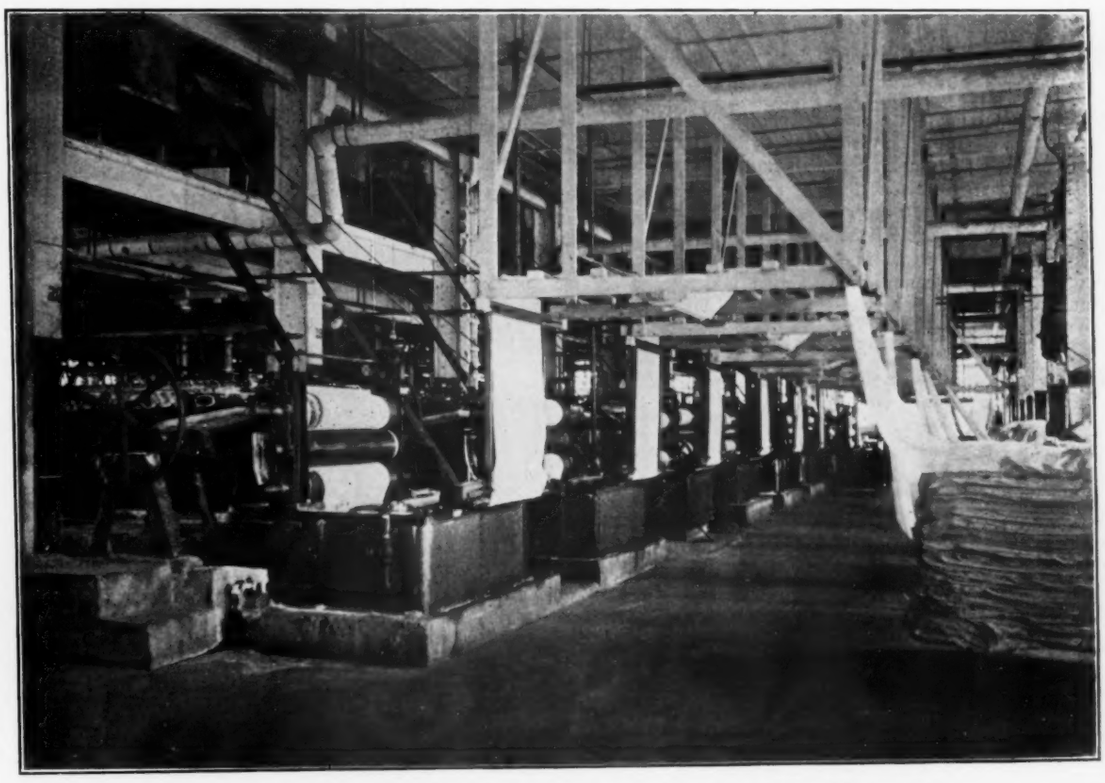
Probably the best record of its work may be found in the following description of the early Butterworth machines and of their latest equipment. Aside from the remarkable increase in speed noted, probably the most important advance made has been the reduction of seconds, and general improvement in quality. In the early days seconds amounted to 20% or higher, while today the percentage is practically negligible.

First Warp Mercerizing Machines

Fig. 1, reproduced from the original blue print, shows the diagram of the first warp-mercerizing machine of H. W. Butterworth & Sons Co., prepared Dec. 29, 1897. The yarn traveled spirally about the drum in Section A., down through the caustic in the tub, traversing around the three rollers shown on the drawing. The movement was similar to that in the rope-washing machines employed in cotton cloth bleacheries. The caustic was kept at 55 deg. Twaddle, and the temperature maintained at 40 deg. F. To insure this, a false tank or jacket, filled with ice, surrounded the caustic tub. The yarn, in its travel, was immersed from 2 to 3 minutes in the caustic. The tension was supplied by the strength of the yarn on the drum. It then passed through the rollers, shown on Section B. of the drawing, and into Section C. where it was washed, soured and then washed again.

Modern Warp Mercerizing Machine

The latest Butterworth warp mercerizing machine is shown in Fig. 2. The warps pass from the creel at the entering end through a water-banding or winding machine in groups of any number up to 10, where they are banded together with water bands. They then pass into a boiling box; after boiling, they go through a cooling box. Before entering the caustic, they pass over a compensator roll (the high structure shown in the illustration). This compensator, which is adjustable, assures the proper tension



Interior View in Mercerizing Department of Jos. Bancroft & Sons Co., Wilmington, Del.

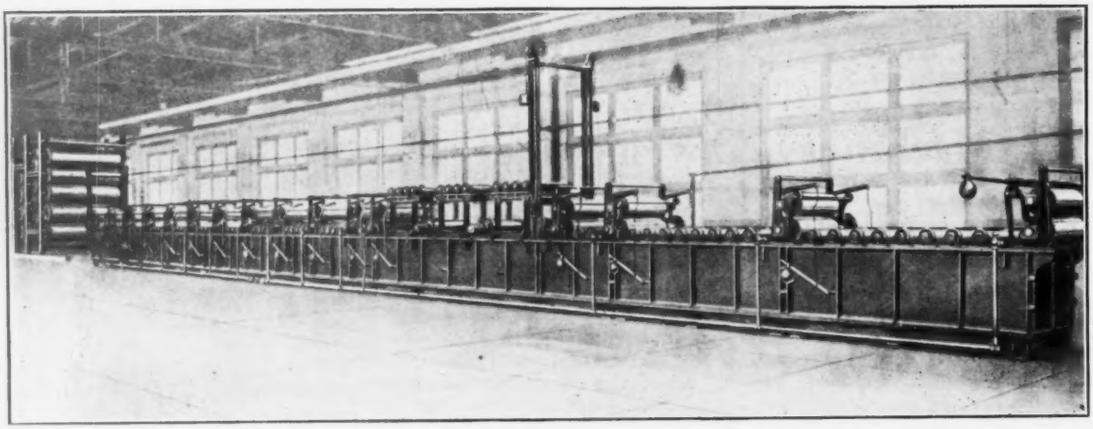


Fig. 2. Latest Butterworth Warp Mercerizing Machine.

for the particular warps being processed. After passing through the caustic, the warps go through successive wash, sour and wash, and direct to drying cans at delivery end. Just before the cans there is another compensator for the regulation of tension.

note that all working parts are overhead where the caustic cannot drip upon them. The goods go through two immersions in the caustic and then through a three-roll padding machine. Passing over an expander, they traverse a 60 ft. tentering frame

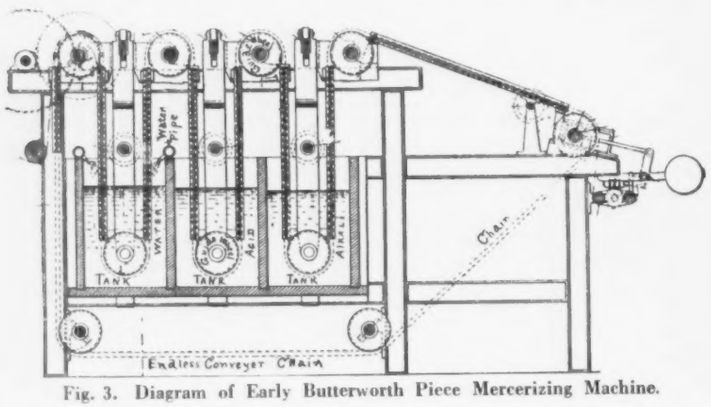


Fig. 3. Diagram of Early Butterworth Piece Mercerizing Machine.

This machine consists of 15 different compartments. Record of an actual 10 hrs. run where quality was the important requirement showed a total of 8600 lbs. On a quantity run, the machine turns out upwards of 9,000 lbs., as compared with the production of 500 to 1000 lbs. per day on the early warp mercerizing machines. Where formerly two warps were handled at a time, the latest machine handles as many as 64 single warps.

Early Piece Mercerizing Machines

Fig. 3 shows diagram of early piece mercerizing machine made by H. W. Butterworth & Sons Co. Goods were fed on to a pin chain into the caustic from the roll at upper left, similar to manner in which woolen goods are fed on tentering machines in finishing plants today. Goods passed beneath rollers in successive boxes for caustic, washing, etc. They were then batched up at the delivery end.

Latest Piece Mercerizing Machine

The most recent piece mercerizing machine developed by Butterworth is shown in Fig. 4, reproduced from a shop photograph. It is important to

where they are sprayed alternately with hot and cold water; then to a two-compartment washing machine, and from there are drawn into rope form and are deposited either into bins or direct into kiers for boiling. This machine mercerizes from 35 to 70 yds. per minute, while the early piece mercerizing machine turned out 1 to 3 yds. per minute.

Textile Finishing Machinery Co.

Although the Textile-Finishing Machinery Co., Providence, R. I., was

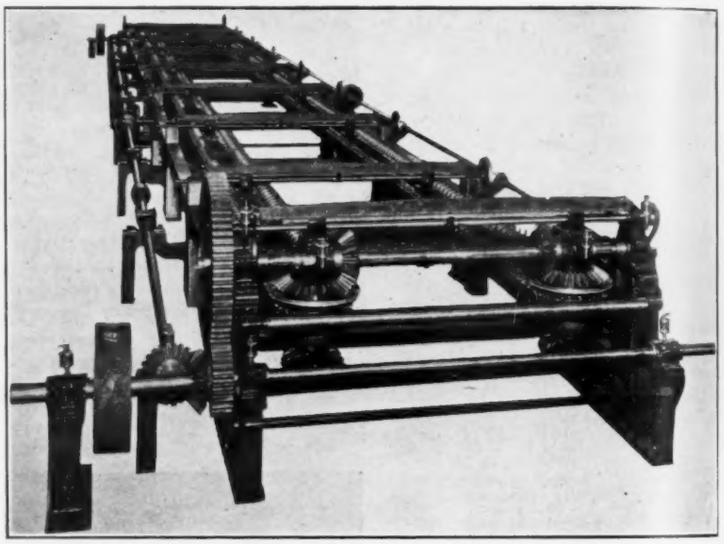
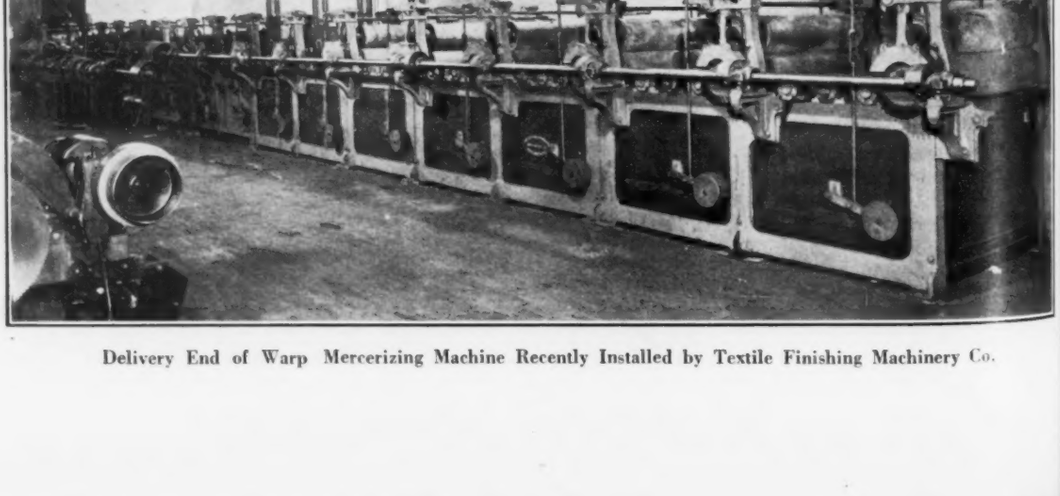


Fig. 4. View of Tenter of Latest Butterworth Piece Mercerizing Machine.

not organized until 1903, it was prominently identified with the early history of mercerizing in this country through its predecessors, the Rusden Machine Co., Warren, R. I., and the Granger Foundry & Machine Co., Providence, R. I. Since its absorption of the latter and several other New England manufacturers of bleaching, dyeing and finishing machinery, its development of mercerizing equipment and such allied machinery as Schreiner, or embossing, calenders has constituted one of the most important parts of its business. It has specialized on warp and piece mercerizing ranges and some of the largest plants in the country have been completely equipped with its machines. One of its most modern types of warp mercerizing machines, recently installed in a large New England gingham mill, is illustrated.

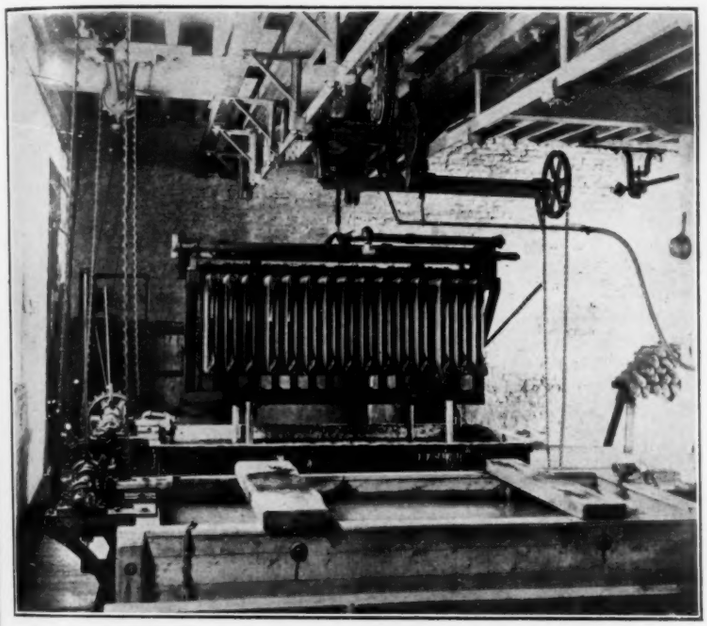
Pioneer domestic mercerizers were fortunate in having available the experience and co-operation of E. A. Rusden, who had been associated for many years with Mather & Platt, Ltd., the well-known English builders of bleaching, dyeing and finishing machinery, Mr. Rusden being well-acquainted with foreign mercerizing machines and processes and, after a short connection with the Lincoln



Delivery End of Warp Mercerizing Machine Recently Installed by Textile Finishing Machinery Co.

Co., Hartford, Conn., establishing his own plant in 1899 in Warren, R. I., as the Rusden Machine Co., Mr. Rusden, who is now president of the Textile-Finishing Machinery Company, early realized that the demand for quantity production in this country demanded the continuous type of both yarn and cloth mercerizing machinery, and he concentrated upon these from the start.

The modern mercerizing machinery produced by this firm is much the same in basic principle as that of 20 years ago, but it has been greatly strengthened throughout, and materially improved in construction details with the objective of securing the maximum possible production consistent with high quality of work, and always keeping economic operation in mind.



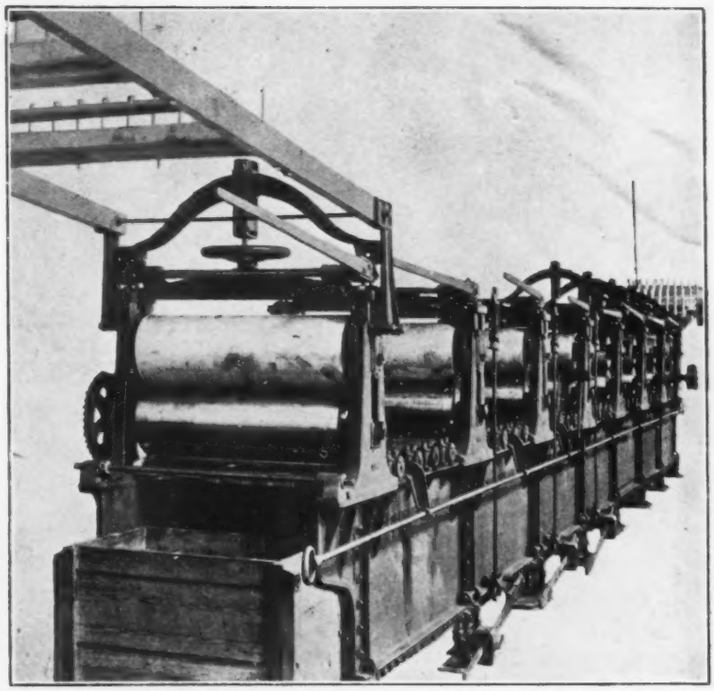
Smith-Drum Co.'s First Skein Mercerizing Machine.

Smith-Drum Company

Although not identified with the machinery builders who co-operated with pioneer mercerizers in their earliest experiments and developments, the Smith-Drum Company, of Philadelphia, has been prominently identified since 1906 in the development of skein and warp yarn mercerizing machinery of modern design and large capacity, and its machines are not only used by many mercerizers in this country, but by many in foreign countries. They describe the development of their machines as follows:

"We developed our first skein mercerizing machine in 1906, after many months of experimenting, for the Kerkies Mercerizing Co., of Philadelphia. This machine had a capacity of 15 pounds of yarn per batch. The stretching was done by means of a hand-crank operating a screw. The frame was loaded and lowered into an iron tank containing the caustic bath; next lifted out of this bath and conveyed by an overhead, traveling pneumatic-hoist to a wooden tank, where it was given an acid treatment, and then washed. It was then transferred to a third tank, where it was finished in a soap bath. The production of this machine was about 150 to 200 pounds per day, its drawback being its low production.

"Next we built a smaller machine, having a capacity of 8 pounds per batch. This was operated on the principle of our present-day machine in that the frame holding the yarn was used only for the actual process of mercerizing. The cage was raised and lowered by an overhead, pneumatic-hoist and the stretching was done by power. Preliminary washing was given while the yarn was still on the machine. This machine had a capacity of about 160 pounds per 10-hour day.



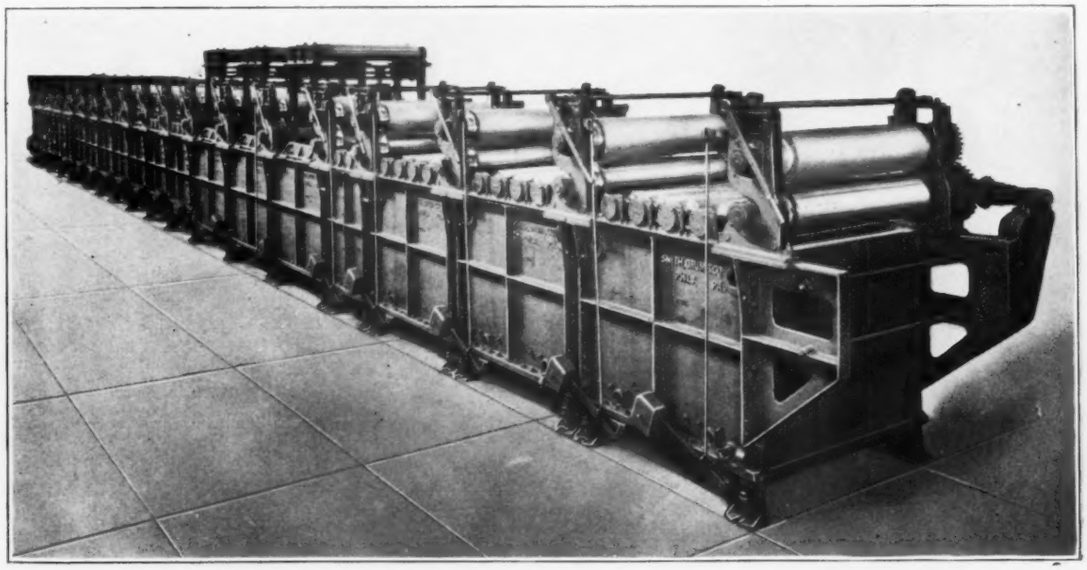
Smith-Drum Co.'s First Warp-Mercerizing Machine.

"We next developed our present machine, which has a capacity of 50 pounds per batch, and a production of 1,500 pounds per 10-hour day. The cage containing the yarn is raised and lowered by, power, stretching is done by power, and a preliminary washing is given while the yarn is on the machine. Travel of the yarn cage, in either direction is automatically controlled on both the belt and the motor-driven machines. The machine itself is much more substantially built than the earlier types, permitting greater stretching, which results in a higher luster.

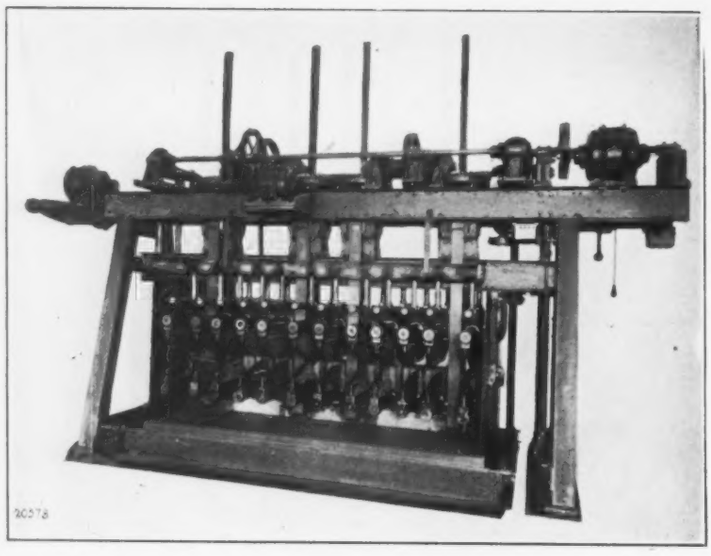
"From the first, the Smith-Drum machines have been successful because of three fundamental rules: (1) Handle as large a batch as possible, thus cutting the chances of variation to the minimum; (2) Our patented design of yarn pole is of such rigid construction that all skeins on the poles are under the same tension; (3) Instantaneous and total immersion of the entire batch of yarn eliminating another possibility of variation.

"Our first warp mercerizing machine was built for the Rhode Island Processing Co., of Coventry, R. I., in 1910. This machine had seven compartments, and a production of about 25,000 pounds of yarn per week. Pressure was exerted on the nip rollers by springs, the tension of which was adjusted by hand.

"The next machine was built in



Smith-Drum Co.'s Latest 18-Compartment Warp-Mercerizing Machine.



Smith-Drum Co.'s Latest Motor-Driven, Skein-Mercerizing Machine.

May, 1913, for Peech Sons & Phillips of Camden, N. J. This machine was somewhat larger, heavier and better mechanically.

"Of later and larger models, one furnished to Aberfoyle Mfg. Co., Chester, Pa., is one of the largest and heaviest machines built by us, and embodies all the latest mechanical features for the production of a high quality of mercerized yarn. This machine has turned out 100,000 to 125,000 pounds per week, running sometimes 24 hours per day for a long stretch at a time. This is also true of a machine built for the Dixie Mercerizing Co., Chattanooga, Tenn.

"We were the first to introduce the idea of fitting carrying roll frames on the caustic and acid tanks. This was on a machine furnished to Aberfoyle Mfg. Co. in February, 1915. This permits longer treatment without additional tanks or floor space. We believe we were also the first to use bronze instead of wood tanks for the acid tanks. This was done on the machine furnished Dixie Mercerizing Co. in 1919. Since 1918 we have built all large machines with carrying roll frames fitted to acid and caustic tanks, roller bearings for the carrying rolls of the different compartments, and selective-differential-drive, which permits increasing or decreasing the speed of warp travel through different sections of the machine.

"Our large machines measure about 90 feet long, weigh 130,000 pounds, and have 18 compartments, whereas our first machine was 46 feet long, weighed 45,000 pounds and had seven compartments. A number of the old type machines have since been brought up to date by the addition of new compartments."

Growth of Cloth Mercerizing

Description of Some of the Early Successes and an Estimate of Present Importance of Industry

STARTING with initial experimental production of heavy goods such as linings and jobbing sateens in 1897-98, the mercerization of cotton fabrics in this country has advanced in tremendous strides until today fully 90% of the lines of converters handling fine yarn goods are mercerized, or part mercerized.

A considerable business in imported mercerized goods, of course, was done in this country prior to the installation of mercerizing machinery in the United States, but on many lines volume business, as volume is regarded today, was developed only after domestic processing was well under way.

To list all the merchandise which goes through mercerization as a matter of course in the finishing processes of today would mean practically calling the roll of nearly all fine yarn goods now being manufactured. As a general statement it is not an exaggeration to say that practically all ply combed-yarn goods turned out in this country are treated with the caustic soda process discovered by Mercer. In instances carded-yarn fabrics also are mercerized, although this practice is by no means general because of the difficulty experienced in securing satisfactory results with carded yarns.

Domestic Finishers Unsurpassed

Primary market merchants of long experience are sponsors for the statement that on all fabrics the work done by mercerizers in this country today is fully equal, if not superior, to that turned out by any foreign finishers.

In some cases this sweeping claim is qualified by a clause to the effect that the American finish is fully equal to anything produced across the water at all times when domestic finishers devote the same amount of time to mercerizing as do their foreign competitors. A few converters express the belief that on certain fabrics mercerized in this country quality is sometimes sacrificed to quantity production, to the advantage of imported goods. Complaints of this kind are by no means general, however, the general sentiment is one of entire satisfaction with domestic finishing.

Artificial Silk Growth

Rapid recent expansion in the use of artificial silk in fine goods has naturally led to a good deal of speculation as to the inclusion of this trend of mercerization. As the matter stands today, it is unquestionably a correct general statement to make, that the increasing use of artificial silk may be expected to cut into the amount of mercerizing of fine cotton fabrics. Mercerization of artificial silk mixture goods presents difficulties which have not been generally surmounted.

Yet developments to date do not seem to confirm this apparently logical conclusion. There are no indications of reduced demand for full mercerized goods, according to a number of converters, despite the growing production of fibre mixtures. In fact, it is no secret that important finishing concerns have in contemplation considerable enlargement of their mercerizing capacity.

Successful experimentation has been done by several finishers on mercerizing artificial silk mixture fabrics, and two finishers are now turning out satisfactory commercial work of this kind on certain goods.

General Development

The first products of mercerizing plants in this country, as previously stated, were linings and sateens. The next development was in heavier goods, such as dress goods and damasks. The application of mercerization of fine goods followed rapidly, the expansion of finishes and of fabrics treated varying with the demands of the consuming public.

It is worthy of note that although refinements in processes and amplification of finishes has accompanied the expansion of mercerizing in this country, the fundamental principle of the treatment remains unchanged from the first days of its development.

Mercerized cotton damasks from Germany first made their appearance in 1899-1900, the goods being a success from the start. The first number brought in by one of the original importers was what was known as "N. B. Damask", which sold for approximately 37½c. a yd. in 34-in. widths. The popularity of these German importations is indicated by the fact that one of the principal importers was always sold 6 to 14 months ahead, and their position in the market was well maintained until the World War put an end to the business in 1914. One of the original importers of these German damasks still claims that a secret process of mercerization was responsible for their superiority, whereas it is now well understood to have been largely due to the lustrous Egyptian cotton used in the yarns and the care taken in mercerizing. Furthermore, it is not a high silk-like gloss that is sought in the finish of modern mercerized damasks, but a linen-like gloss and feel, and in the production of the latter finish, certain American mercerizers are not excelled. Production of mercerized damask, in this country, did not start until about 1905, but rapid strides were made and the domestic industry was soon turning out a volume that dwarfed total imports.

Those acquainted with the development of business in imported mercerized goods, will remember the heavy importations, starting about 1900, of what were known as mercerized vestings, or waistings, which were really fabrics formerly utilized for men's vests, but that by reason of the substitution of mercerized yarns for silk and worsted, were made available at prices that made them popular for women's waists and separate skirts. These fabrics were usually made of Egyptian yarns, and some were of comparatively fine count particularly the damask weaves, counting as high as 220 threads to the inch. The majority, however, were comparatively coarse in construction, with matelassé weaves predominating, and few but white fabrics being popular. The mercerized yarns in these heavy goods were processed in skein form, but most of the damask and other light weaves were piece mercerized. This vogue was a short one, women's style turning definitely away from their use in 1902, and they have never come back for women's wear, although similar weaves long retained popularity for men's vests, and were utilized during the last two seasons in novel colored patterns and effects for women's jackets.

Outstanding Successes

It is interesting to record that the first mercerized fabric converted by Fred Butterfield & Co., one of the pioneers in this business, was placed on the market in 1898-99. It was a full mercerized filling sateen, fully combed, and was called "Amisilk." Finished by Bancroft, its success led to the rapid extension of this company's business on mercerized goods, in which it is a leader today.

Among the outstanding merchandising successes made by mercerized goods, mention must be made of "Heatherbloom." This nationally advertised petticoat fabric was full mercerized, beetled and schreinered, and its vogue was enormous until the decline of the petticoat as an accepted part of milady's wardrobe.

Among the finer count goods of general utility, the first most pronounced success was "soisette" manufactured by the Ponemah Mills, Taftville, Conn., mercerized by the Glenlyon Dye Works, and sold through Clarence Whitman & Co., New York City. This fabric was produced in a wide

range of colorings, was equally adapted for men's shirts, women's lingerie and a large variety of other uses, and needs no special description for it is as well known today as it was over 20 years ago when it was first placed on the market. It is one of the few early mercerized productions that has made a permanent place for itself in the market, and has maintained its leading position for years, despite numerous attempts to duplicate.

The enormous growth in popularity of woven underwear fabrics has created another large field for mercerized goods, and the end is by no means in sight. In dress goods, beautiful effects are being turned out in mercerized warp and pure silk filling goods, mercerization having no harmful effects on the classes of thread silk yarn used in this character of merchandise.

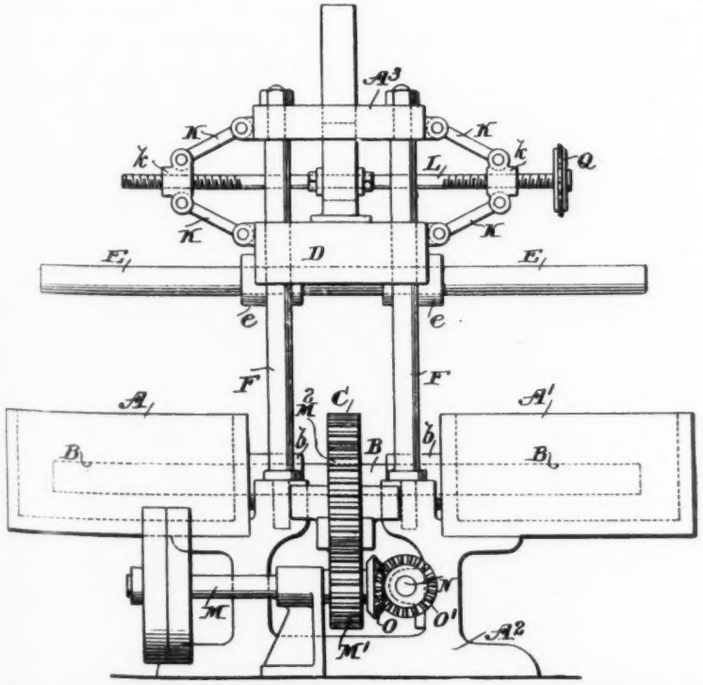
The Litigational Period.

Defeat of American Mercerizing Co. in 1906 Made Basic Patents Free to All

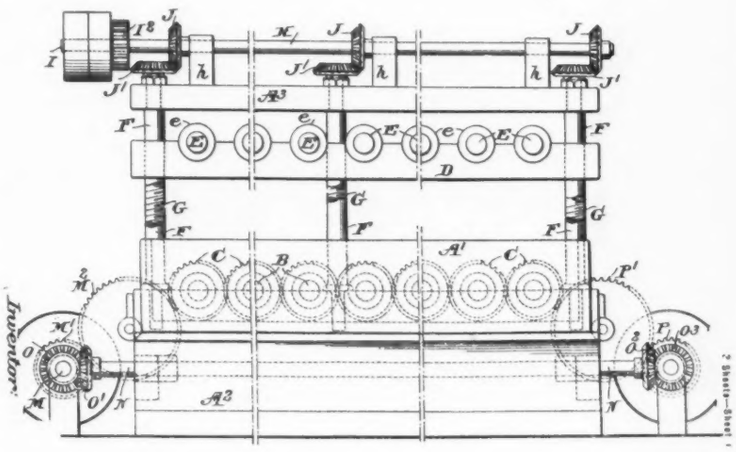
ONE of the most notable phases of the history of mercerization in this country was the protracted legal fight waged by the American Mercerizing Co. in its efforts to sustain the Thomas & Prevost patents as basic in controlling the mercerization of cotton yarns and cloths in this country. It was one of the most important textile patent infringement suits ever carried through U. S. courts, not only because of the rights involved, but because of its protracted nature and the large cost of the lawsuit.

The American Mercerizing Co. was incorporated under New Jersey laws in the summer of 1899, with an authorized capital of $250,000, to take over the sole rights in this country to the patents of Richard Thomas and Emanuel Prevost, which had previously been acquired by the American Thread Co. from the German firm of J. P. Bemberg Baumwoll Industrie Geselschaft, and the Hampton Co., Easthampton, Mass., was made the object of a test case, the original bill of complaint being filed Nov. 28, 1900. For more than a year prior to this date the American Mercerizing Co. and the American Thread Co. had warned domestic mercerizers against infringement of the Thomas and Prevost patents, and from that time until the suit was dismissed in 1906 unlicensed mercerizers operated under the threat of being obliged eventually to pay damages and make an accounting of profits to the American Mercerizing Co., and, to some extent at least, the broad development of the industry was restricted. On the other hand, the suit against the Hampton Co., decided in a final manner that British patent No. 4,452, dated March 21, 1890, and granted to Horace A. Lowe, was basic, thus depriving the Thomas and Prevost patents of priority, as had previously been done by the British and German courts, thus making mercerization of cotton yarns and cloths free to all as far as basic patents were concerned.

The following firms were licensees of the American Mercerizing Co.: The American Thread Co., J. and P. Coats, Ltd., Clark Thread Co., (O. N. T.), John Clark, Jr., & Co., (Mile-End), the Aberfoyle Mfg. Co., the J. R. Montgomery Co., William H. Lorimer's Sons Co., and Greenwood & Bault. The officers of the American Mercerizing Co. were as follows: President, John H. Lorimer, William H. Lorimer's Sons Co.; treasurer, William T. Galey, Aberfoyle Mfg. Co.; directors, the former and John Greenwood, Greenwood & Bault; R. C. Kerr, American Thread Co.; J. R. Montgomery, the J. R. Montgomery Co.; William Clark, Clark Thread Co.



End Elevation of McConnell Machine, Showing Toggle-Joint Tension.



Side Elevation of McConnell Skein-Mercerizing Machine.

The Hampton Company had started business less than a year before they were sued by the American Mercerizing Co., and Thomas McConnell's U. S. patent, finally granted, Sept. 11, 1900, and numbered 657,705 was specifically at stake. The Thomas and Prevost patents directly involved were Nos. 600,826 and 600,827, granted March 15, 1898. Although all other unlicensed mercerizers of that period operating in this country were indirectly involved in the Hampton Co. lawsuit only the Arlington Mills actively participated with the Hampton Co. in the defense.

The attorneys for the complainant were Bartlett, Brownell & Mitchell, and Louis C. Raegener, of New York City, while the defendants were represented by George L. Roberts & Bro., and Henry F. Harris, of Boston. The case was tried before Judge Lowell of the U. S. Circuit Court, District of Massachusetts, sitting in Boston. Among the chemists and manufacturers who appeared for the complainants were Arthur D. Little, John H. Hunter, John H. Lorimer, and William H. Walker; for the defense the following were among the experts who testified: Frank Cheney, Jr., William D. Hartshorne, Charles F. Chandler, Otis L. Humphrey, and the late William W. Crosby. The preparation of the cases for both sides involved an enormous amount of research work, laboratory and practical demonstrations of the various processes, microphotographic work, etc. The records of the case are comprised in three large volumes and several pamphlets covering a total of nearly 2,000 pages. The latter as previously noted, contain a very accurate record of the state of the art at that time, as well as of the prior act, although not in form for easy reading.

Played for Large Stakes

The case dragged along in the courts until 1906, the final decision being rendered by Judge Lowell on Aug. 7 of that year. Long before the case was decided, however, it was generally believed that nullification by the German courts in January, 1901, and February, 1902, of the last two amended patents in that country of Thomas and Prevost left the owners of their rights in this country with hardly a leg to stand upon; but because of the uncertainty surrounding patent law, and the strong financial backing of the American Mercerizing Co., few more mercerizers entered the field during this period. Some idea of the large interests at stake in this suit may be gained from the bitterness with which it was contested and the large array of legal and expert talent involved. It was reported at that time that the American Mercerizing Co. would have paid to the German owners of the Thomas and Prevost patents $750,000 if the patents had been confirmed by the U. S. courts.

The importance of the yarn mercerizing industry at the time of the American Mercerizing Co. suit was emphasized by testimony of John H. Lorimer, president of the company, to the effect that since the beginning of 1899 to 1904 the American Mercerizing Co., or its licensees, had mercerized about 14,000,000 pounds, this taking no account of the millions of pounds mercerized by unlicensed firms.

Arthur D. Little, of Arthur D. Little & Co., Boston chemists, who was an expert retained by the complainant, testified in 1904 as follows: "It

is estimated that more than 20,000,000 pounds of similar high-grade yarns have been treated by the process of mercerizing under tension for the production of silky luster by concerns in this country other than this mercerizing company and its licensees, representing a value of over $17,000,000 in less than five years." This the complainants claimed "proved the extraordinary character of the utility and commercial success of the discovery, its importance and revolutionary character."

Vital Point in Defendant's Case

One of the most vital features of the evidence advanced by the defendant, and one that went a long way toward demonstrating lack of priority in the lustering feature of the Thomas and Prevost patents, was the contention and demonstrated proof that luster was an unavoidable result of both the Mercer and Lowe processes, provided suitable yarns were used and handled in ordinary warp-dyeing, or roller-cistern machines. The portion of the brief of George L. Roberts, attorney for the defense, that sums up this matter is as follows:

"The use of roller cistern apparatus as directed in Mercer's original British patent No. 13,296, of 1850, would sufficiently counteract the tendency to shrinkage caused by the caustic alkali in the process of mercerizing cotton yarn in warp chain, and presumably also cotton cloth in the piece, to enable the yarn or cloth so treated to exhibit when dry practically all the silky luster of which it is capable when subjected to any other known process of mercerization under tension. Indeed practical proof of this fact has been furnished on a commercial scale by the circumstance that the Arlington Mills of Lawrence, Mass., began its mercerization of cotton warps to be woven into fancy dress goods manufactured for the markets in the fall of 1897 by the use of just such a roller-cistern apparatus, which had previously been used for warp-dyeing and which had no squeezing rollers at its initial end. The product was entirely satisfactory and demonstrated the efficiency of the old roller-cistern apparatus for restraining shrinkage sufficiently to secure a degree of silky luster, which satisfied the requirements of the market."

The McConnell Machine Described

The skein mercerizing machine invented by Thomas McConnell and that was used by the Hampton Co., and was one of the chief objects of the suit against this company by the American Mercerizing Co., is described and illustrated in the latter's brief, appearing as follows in Vol. I. Pages 631 to 634 of the court report:

"The apparatus employed by the Hampton Company for mercerizing yarn in the skein was built upon substantially the same plan as that described and shown in the United States patent No. 657,705, granted September 11, 1900, to the Hampton Company assignee of Thomas McConnell. The mode of operation was as follows:

"The skeins of yarn after having been boiled out were mounted in a damp state upon the rollers while the vats were empty; and the upper rollers in the vertically adjustable frame were then moved away from the stationary lower rollers until the skeins mounted thereon had the slack taken out of them by making the yarn taut. In this position the frame carrying the upper rollers was fixed and the machinery was started, thus giving to the skeins a movement of circulation like that of a driving belt running over two pulleys. The caustic soda solution was thereupon run into the vats and the circulating skeins were exposed to its action for several minutes; then the canstic soda solution was run out of the vats and when these had been emptied they were filled with water and the skeins were circulated therein. After this washing in water had continued for several minutes, the upper rollers were gradually moved farther away from the lower ones and the vertically adjustable frame was fixed in a new position so as to subject the yarn to more or less additional stretching, according to circumstances. In such condition of increased tension the yarn was still circulated for a few minutes through the same water. This was then drawn off and fresh water was substituted in which the circulation of the yarn was continued for a few minutes more. The vats were thereupon emptied; the frame carrying the upper rollers was moved downwards, and the yarn was taken off. While the yarn was exposed to the action of the caustic soda solution and during the succeeding operation of washing it in water, the yarn was simply kept from shrinking, and not until after it had undergone such washing was it in any degree elongated by a change in the adjustment of the frame carrying the upper rollers. The amount of stretching given to the yarn during washing operation as described, varied according to the judgment and discretion of the superintendent; some yarns were not subjected to any additional stretching whatsoever, but the skeins were simply maintained at the initial tension under which they were put at outset.

"Yarn in the chain was mercerized in an apparatus consisting principally of a series of rectangular tanks, a series of squeezing rollers mounted above the tanks, and a series of guiding rollers located within the tanks. All these rollers were placed with their axes exactly transverse to the longitudinal direction of the series of tanks. The guiding rollers comprised a horizontal row located near the bottom of the tank, and another horizontal row near the top of the tank above the level of the liquid.

Each set of these guiding rollers had one more roller at the bottom than at the top, and the upper ones were placed vertically above the spaces between the lower ones. The squeezing rollers occupied positions immediately following the locations of the successive sets of guiding rollers in the direction of the length of the series of tanks. Each pair of squeezing rollers consisted of a lower roller positively driven and an upper parallel roller pressed down upon it under the stress of weighted levers.

"The first tank contained the caustic soda solution. It had mounted above it a preliminary pair of squeezing rollers at its initial end, and after that a pair of squeezing rollers following each set of guiding rollers within it. Next after the caustic soda solution tank was a washing tank divided into two separate compartments and both containing water. Each of the compartments was provided with a set of guiding rollers within it and had mounted above its terminal end a pair of squeezing rollers. Immediately beyond this washing tank was a stretching device consisting of a set of five rotatable rollers having relative locations similar to those of a set of guiding rollers. It had three bottom rollers journaled in a stationary frame and two upper rollers journaled in a vertically sliding frame which was forced upwards under the stress of weights. Beyond this set of stretching rollers and extending in the same longitudinal direction as the portions of the apparatus already described, was a series of tanks, the first of which contained acidulated water, and the rest mere water. Each was provided with a set of guiding rollers within it and had mounted above its terminal end a set of squeezing rollers. Above the initial end of the first tank of this series was journaled a single roller.

'The yarn chains mercerized in this apparatus consisted of a group of separate threads varying in number from 100 to 2000, more or less according to the requirements of their final use. Before mercerizing they were boiled out. Several chains of yarn were passed through the mercerizing apparatus side by side. The length of each set of chains varied greatly, according to circumstances, from not more than 200 up to 20,000 yds. These chains, carefully held taut enough to keep their constituent threads substantially parallel and free from tangling with each other were entered in a wet state between the initial pair of squeezing rollers of the mercerizing apparatus and thence were passed through the caustic soda solution down and up, under and over the guiding rollers of each set and between each succeeding pair of squeezing rollers successively. The yarn chains passed through the tank containing the caustic soda solution, as well as through the next succeeding washing tank, without change of length. All the squeezing rollers mounted upon these tanks were of uniform diameter, and were driven at the same speed. The sets of squeezing rollers mounted upon the last series of tanks following the stretching device were also of the same diameter, and were driven at a uniform speed; the rate of this being sufficient to maintain the rollers upon the sliding and weighted frame of the stretching device at a uniform height, so as to compensate for the increase of length which was given to the yarn by such additional stretching. During the passage of the yarn through the caustic soda solution and through the immediately succeeding washing water, it was simply prevented from shrinking; but under the stress of the weights applied to the stretching device it was elongated more or less, and was thereafter maintained at its increased length during the remaining operations of washing in acidulated water and in pure water.

Summary of Decision in Case

The summary of the decision of Judge Lowell of the U. S. Circuit Court, Boston, handed down Aug. 7, 1906, and dismissing the suit of the American Mercerizing Co. vs. Hampton Co. et al, is as follows:

"Summarizing the history we find that Mercer first suggested the process which has since gone by his name; but he did not distinguish between different kinds of vegetable fibre, nor between the application of acids and alkalies. As the shrinkage was uncontrolled, no practical result followed from his invention, and the silky luster, which is by far the most important result of mercerization was not suspected by any one. Forty years later Lowe first discovered and suggested mercerization under tension. He further improved upon Mercer by differentiating the various kinds of vegetable fibre and limiting the process of mercerization to cellulosic fibres (such as cotton and flax). He also limited his mercerizing agent to caustic soda, and thus pointed out the practical limitations of the art. He discovered that the process would give to the cotton mercerized a glossy appearance; but he did not fully recognize the importance of this result. His invention did not go into practical use, probably by accident, and so the emphasis which experiment would have put upon the luster did not arise from his discovery. Thomas & Prevost, perhaps independently, discovered mercerization under tension. At first they knew nothing of the luster thus imparted, that is to say they offered no suggestion beyond Lowe's as to method, and they knew less than did Lowe of the result. But their process came into use and by their experiment and by that of others, the silky luster was found to be all important. Thomas & Prevost then tried to save themselves from the anticipation of Lowe by suggesting unimportant differences. These attempts have failed wherever there has been a contest. They bought out Lowe but the success they secured in Great Britain and elsewhere is unavailing in the United States where Lowe's invention belongs to the public. It follows that the claims in suit are anticipated by the British patent to Lowe and the bill must be dismissed with costs."

Theory and Science in Mercerizing

A Review of Recent Researches, Largely English, Designed to Explain what Happens in Each Step of Process—Aim at More Certain Control and May Provide Standard and Accurate Measure for Mercerizing Results—Process Still Something of Mystery

By *Charles F. Goldthwaite.*

ALTHOUGH mercerization was first discovered over seventy-five years ago, the process is still somewhat of a mystery. The primary action of caustic soda on cotton was noticed by accident and the practical methods of operation have been slowly developed in a rather empirical way. Some chemistry and much mechanical ingenuity have been introduced; many experiments have been made both to improve and to explain mercerizing; but a final explanation of the cause of the mercerizing effect is still in the future.

Our present task will be to outline what the reader will probably think of as the theory of the subject, but what is really a review of a number of the more recent attempts to arrive at an explanation of just what happens at each step in the process, and of the necessity for the various essential details. A clearer understanding of the exact action of caustic soda on cotton will eventually lead to simpler or cheaper methods of production, or a finer product.

Mercerizing is sometimes defined as the treating of cotton with caustic soda of proper strength and temperature for a sufficient time and then washing the cotton free from the alkali. To be consistent the more familiar complete operation is then called mercerizing with tension. Since nearly all practical work employs tension, we shall consider the term to mean mercerization with tension unless otherwise particularly noted.

Study of Surfaces

The most important property of mercerized cotton is its lustre and this is dependent first of all upon the reflecting power of the surface. Therefore the first step in studying lustre is to study surfaces, and we must distinguish at once between the external surface of yarn or cloth and the surface of the separate fibres of which it is composed. The external surface is composed of fibres in some manufactured state and the appearance of lustre is influenced very much by contrast between different parts of the surface, these in turn being affected by their angle to the light.

While something is known about the most suitable yarn or fabric surfaces necessary to the best commercial mercerizing effects, there is no reason to think that these cannot be improved by a better understanding of the separate fibres.

The plain cotton fibre has lustre, although it is not ordinarily noticed, for if viewed under the microscope there is strong lustre at the points where the light is reflected to the eye. Even a fibre mercerized without tension will show the same effect. In yarn, and more particularly in piece goods, this natural lustre does not show to any great extent because the minute surfaces are not arranged to reflect light all in one direction, but disperse it in all directions like a piece of ground glass.

Fibre Constituents Affecting Lustre

In the ordinary cotton fibre the surfaces are provided by its flattened form, and the variety of direction by the numerous natural convolutions. In spinning and weaving these fibres cannot be combined so as to form the larger reflecting surfaces required for lustre, for the great number of convolutions gives the appearance of a broken surface as already mentioned. At this point, however, we run into another view advanced by W. L. Balls, one of the highest authorities on cotton. Speaking of unmercerized cotton he says that lustre is almost synonymous with twist. If all the hairs in a sample are well and evenly twisted there will be an infinite number of convex surfaces, each reflecting a spot of light. He apparently attributes lustre to a great number of convolutions uniformly covering the cotton fibre, rather than to straight fibre surfaces without so many convolutions. He also implies that lustre is more than a reflection from the outside surface and considers it closely connected with translucence of the fibre wall and reflection of light back from the interior surface. Treatment with caustic makes the fiber more transparent and may thus improve the lustre from internal reflection. Probably these views can be harmonized but at the moment it is apparent that the subject of lustre has not been studied any too thoroughly.

An idea has been prevalent that lustre is due to the removal of the cuticle of the cotton fibre. First let us define cuticle. According to Balls, there is apparently a very thin outer layer of undefined composition, possibly identical with the "incrusting substances" mentioned by other writers; then the primary layer of cellulose which we commonly call cuticle; and finally the cellulose of the so-called secondary thickening inside the outer wall and differing in some way from it. If the term cuticle refers to the very thin outer layer it may possibly be removed by caustic; if it refers to the primary layer of cellulose, it is not removed because we shall see that it remains in place during mercerization in caustic of all strengths and imposes a final limit to the swelling of the fiber contents. Again, if the removal of the cuticle caused lustre we would expect it on goods mercerized without tension because the same caustic is used. On the other hand, if the external purities come off the lustre will be improved.

The Real Sources of Lustre

Present evidence, then, indicates that lustre arises from reducing the number of natural convolutions and making the fibres straighter and more parallel. Years of practical evidence also indicate that these are the things that happen from tension acting on cotton that is made plastic by soaking in caustic. This view is amply supported by current practice in fabric structure. Everything points to smoothness and parallelization as being essential. The best results are obtained from long, fine staple, made into combed, gassed yarns, or into fabrics like sateens, which feature parallel threads. Any finishing material that appears as a rough coating on the fibres, or any accidental deposit, such as that from soap and hard water, will impair the light reflecting power and hence the lustre.

Single yarns do not as a rule mercerize well, so they are doubled for yarn mercerizing. The twist is the next important factor, and it has been so long recognized that certain standards have become known as "mercerizing twist." A comprehensive set of experiments by Corser and Turner on 60s-2 yarns has shown that the highest lustre is displayed by yarns of the softest doubling twist, while with any *given* doubling twist the best effect was obtained with medium twist in the singles; and the poorest, with a very soft singles twist, owing apparently to the many loose fibre ends that protrude from the yarn.

By the aid of a device for measuring lustre, which is described later, Adderley and Oxley have derived a formula for yarns from 40s-2 to 3s-2, the maximum lustre being obtained when the doubling twist equals K (their constant used in spinning) multiplied by the square root of the resultant counts. (t=K resultant counts).

They also found that irregularity of twist in either the singles or in doubling detracted from the lustre.

Research Work on Single Fibres

Former studies on mercerization have usually considered the physical changes in yarns and fabrics, for example, shrinkage, where the property under observation depends on complicated variable conditions whose influence cannot be separated.

Since the most valuable result can only come from the study of one condition at a time we have to begin with the problem in its simplest possible form. So, although the actual manipulation is anything but simple, recent investigators have begun work with the single individual fibres, uncomplicated by twist, slippage, tightness of packing and other things that enter into experiments on yarn or cloth.

It is difficult enough simply to measure single fibres of cotton "lint" with their curves and convolutions. The matter is far more complicated when experiments are performed on them, and changes in their inch of length and twelve hundredths inch diameter have to be accurately observed and recorded.

Then again, such natural products are seldom if ever twice alike, so it is necessary to study a great many individuals before a conclusion can be reached about them in general. However, such a study, tedious and expensive as it is, seems essential if we are to understand perfectly the mercerization of either yarns or fabrics, because it is the behavior of the innumerable single fibres that determines the finish or other desirable properties.

The Swelling of Single Fibres

The swelling of the cotton fibres in caustic solutions is very significant in mercerizing and the actual changes that take place are astonishing. A research by Collins and Williams is summed up in Fig. I. for single cotton fibres without tension. This tells us that the greatest swelling which is considered to represent a point of great sensitiveness or plasticity occurs at about 14.5% actual caustic strength of solution. It is shown directly by

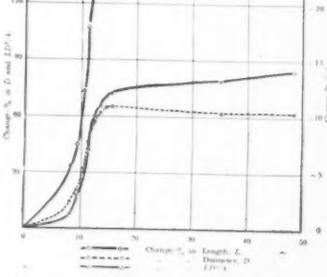


Fig. 1. Swelling of Single Fibres

the change in volume of the cotton fibres as represented by the upper curve. There is a sharp maximum point followed by a tendency to decrease as the solution is made stronger. (Numbers at the bottom are per cent caustic strength). It is also very interesting to note that the middle curve represents change in length, which is a contraction or decrease measured by the minus numbers at the right, and which becomes nearly constant after a rapid loss, changing abruptly at about 14.5% caustic and 12% decrease in length. The lower curve represents increase in diameter as the swelling increases with strength of caustic. It rises rapidly to an abrupt change and slight falling off at about 14.5% caustic strength.

It can be seen that the loss of 12% in length is so far overbalanced by an increase of over 60% in diameter, that the increase in size is nearly 150%, or in other words, the fibre swells to a maximum of almost two and a half times its former size. It does not necessarily follow that a skein of yarn or piece of cloth being mercerized should show such a degree of swelling because many other factors come into play, but we do know that the material swells and it seems evident when such sharp changes take place between 14% and 15% caustic strength that this point must have particular significance.

The Effect on Fibre Length

Another very complete picture of the action of caustic on single cotton fibres is shown in Fig. II. It

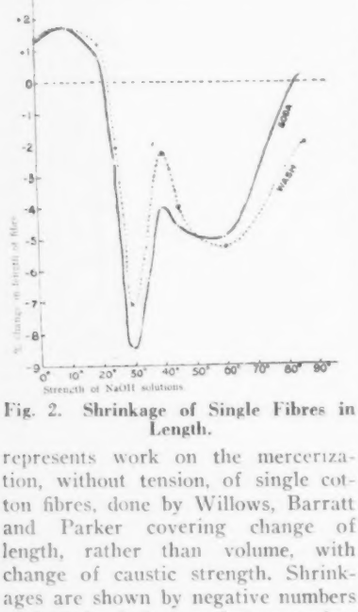


Fig. 2. Shrinkage of Single Fibres in Length.

represents work on the mercerization, without tension, of single cotton fibres, done by Willows, Barratt and Parker covering change of length, rather than volume, with change of caustic strength. Shrinkages are shown by negative numbers at the left. It is seen that mercerization really begins at about 22° Tw or 10% strength of caustic solution and contraction, i. e., shrinkage, proceeds very rapidly as different solutions are used up to 30° or 13%, which corresponds very closely with the point of maximum swelling as shown in Fig. I. From 30° to 40° (17.67%), however, there is a range of less swelling and the original authors suggest that 40° would be the proper strength if it were desired to increase the affinity of cloth for dyes by printing with caustic, without causing too great a shrinkage.

Approaching 50° (22.45%) there is a little more shrinkage but not nearly as much as at 30°. From 50° to 60° there is almost no further change, while above 60° (27.12%), the contraction rapidly decreases.

The dotted line is of interest as showing where the same fibres go on washing. They tend to lengthen until 50° is reached, when there is a further contraction. This is quite probably a further mercerization effect due to dilution of the caustic in the fibre as it comes in contact with the wash water, certain weaker solutions giving greater shrinkage.

It might seem more sensible at first sight to make all these tests on fibres under tension or at least held at their full length, instead of practically without tension. However it will be obvious that all of the variations could not be observed if the fibres were not free to change in length. Even though the changes in practical mercerizing do not take place under the above conditions, these tendencies are present and affect the results.

Absorption Tests

Another important and interesting set of experiments leads to very much the same conclusions in a different way. Coward and Spencer devised a very small "whizzer" with a speed of 7,000 R.P.M. which throws all the water out of fibre or cloth except that actually absorbed as distinguished from that which might be held between the fibres. The striking result is that cotton which holds only ½ of its own weight of water will retain between 2¼ and 2½ times its weight of caustic of mercerizing strength when centrifuged under the same conditions. This corresponds to an increase to nearly three times its original volume.

Tests on a fabric give a similar absorption for water, and the same type of curve for caustic but the amount was very much less. The fibres are apparently not as free to swell. It is suggested that the greater freedom of the fibres in yarn leads to better results than obtained with pieces, and that poor results from piece goods made from tightly twisted yarns are due less to poor penetration than to inability of the fibres to swell sufficiently.

In these tests, a sharp change at 14.3% marked the full extent of the swelling, a very close check with the 14.5% of the previous investigation, and quite near the maximum shrinkage in length at 13%. It would seem that somewhere in the neighborhood of 14% to 15% caustic there must be a very significant point for mercerization although practical conditions usually necessitate the use of stronger solutions. It is natural to suppose that the fibres will be most plastic and most susceptible to tension at or near the points of maximum swelling and shrinkage in length, which very nearly coincide.

"Cuticle" Limits Swelling

There has been a tradition that during mercerizing the cuticle, apparently meaning the primary wall, is so affected by the caustic as to come off from the fibre. There is no good evidence that this occurs, while several things indicate that it does not. Later views suggest that it is this cuticle that limits the swelling of fibres put into caustic solution. A rapid increase of swelling with change of caustic strength, takes place up to between 14% and 15% caustic solutions, and then stops, apparently because the outer layer of the fibre can swell no more.

Supporting this view is the fact that cut fibres under similar circumstances bulge out at the ends like mushrooms, suggesting that the interior (secondary) cellulose is under a considerable pressure held in restraint by the primary wall, or cuticle. This is very clearly shown in Fig. III., a photograph of short lengths of cotton fibre.

The swelling of cotton fibres in

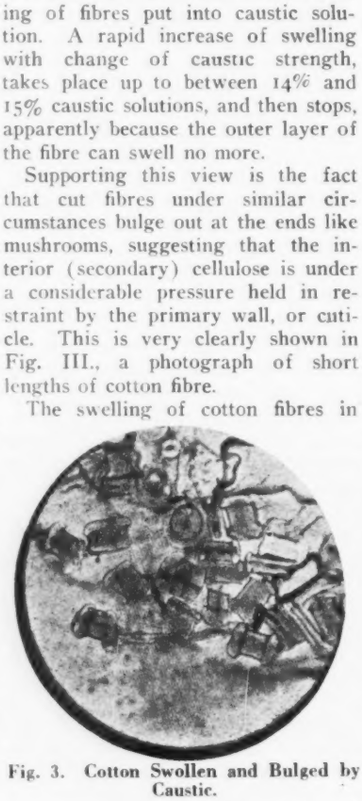


Fig. 3. Cotton Swollen and Bulged by Caustic.

diameter at the expense of length depends on their minute structure. The exact changes are not yet understood but swollen fibres have already been utilized to obtain light on the subject. The more visible changes are thickening of the walls, partial or complete filling-up of the center, or lumen, and the disappearance of convolutions.

Duration of Caustic Action

Coming back to a more practical point, it has been found that cotton fibres contract in diameter as the caustic is washed out. This no doubt has a direct connection with skein yarn, for example, slackening; i. e. increasing a little in length, while being washed on the poles of the mercerizing machine. This contraction or "unswelling," however, follows a little behind the washing and one writer suggests that removing the tension too soon in cloth mercerization may account for some unsatisfactory results that have been obtained. Washing under tension should continue until the alkali content of the yarn has fallen way below the minimum mercerizing strength of caustic.

It has also been found that the action does not take place as quickly as usually thought. Instead of being over in a few seconds, the complete action of caustic of mercerizing strength on single fibres requires about three minutes. We would expect the time to be longer on yarn or fabric to get penetration. In the case of yarn, caustic of proper strength may be in the machine but not get all through the yarn. In entering, it is of necessity wet, and the water has to be replaced by full strength caustic.

Practical mercerizers will naturally be governed by results, and probably in most cases the time of immersion in the caustic, plus a stretching or wringing period, plus the time consumed in the first stages of the washing, while mercerization is still going on, will make a total sufficient at least for complete action on the surface fibres. It is probably not important that mercerization extend to every fibre through the yarn or fabric for ordinary lustre goods.

The Influence of Temperature

There appear to be no very important recent investigations on the effect of temperature. What little is known confirms present practice of trying to keep the caustic reasonably cool. At ordinary mercerizing strengths there seems to be little difference in results while operating at ordinary mill temperatures or down to 32° F. However, refrigeration is sometimes used and the statement has been made that a 6.5% solution of caustic at 14° F. will give the same results as a 29% solution at 61° F. Cost of refrigeration versus caustic usually settles this point.

Variations in Mercerized Strength

It has always been stated that considerably less tension is required to maintain a yarn at its original length during mercerization than to stretch it back after it has been allowed to contract during the process. The same thing has been found true of single fibres. Where 0.16 gram would maintain the original length, it required 0.32, twice as much, to regain it after allowing to shrink.

Ordinarily the increase in strength of cotton on mercerization is of no practical interest, although it does figure in some special requirements. Increase in tension up to a certain point gives rise to increase in strength. This effect is more noticeable in yarns with soft doubling twist, the harder two-ply yarns giving less increase in strength with the higher tensions. The softest yarns tested showed gain in strength of about 20% to 45%. The hardest yarns varied from gains of 13% down to actual losses depending upon the structure of yarn and the method of testing. The values quoted are only intended to give an idea of the possibilities of varying the strength by a study of mercerization.

Another somewhat peculiar result was that for any gray single yarn of these particular experiments, the two-ply strength increased as the doubling twist was increased. In corres-

(*Continued on page 276*)

Review of the Mercerizing Industry in Europe

The Experiments, Patents, Processes and Machines That Formed the Basis of the Whole Industry—Descriptions of Early Yarn and Cloth Machines—The Latest Types—Caustic Recovery Apparatus—Little Yarn Processed in Warp Form

By *Raffaele Sansone*, Genova, Italy.

IN 1844, John Mercer, while filtering alkali-makers' red liquor through cloth, observed that this contracted in the wetted portions, swelling considerably, and was led to conduct a certain number of experiments, and resulting in taking out a patent in 1850. The specification of the patent claimed that new effects could be obtained on vegetable fibres by submitting these to the action of caustic soda lyes between 40 and 50° Tw., to sulphuric acid of 150° Tw., or to a chloride of zinc bath. Mercer affirmed that if cotton cloth was run through a caustic soda lye from 40 to 60° Tw. it shrunk in length and in breadth, and acquired greater strength and firmness, taking up certain coloring matters with greater facility.

Although crimping is not mentioned in the above specification, Mercer quickly discovered the method of craping cotton, and showed patterns of the new styles produced at the London exhibition of 1851. For the purpose he had treated knitted cottons with strong caustic soda lye, with the result that they had a closeness unattainable by any other means, and also printed cotton fabrics in patterns and stripes with the lye, allowing this to dry on and then steaming, obtaining contracted portions on a smooth ground. The exhibits also included piece goods, half of which had been treated with the lye, while the other half had been left untreated; the whole piece having been dyed in the same bath. In this way the greater fullness in color of the treated part in comparison with the other half of the piece was very noticeable, proving the greater affinity for dyestuffs acquired. A great hindrance to the success of the new process was the high price of the caustic soda then available, and also the fact that the shrinkage of cotton goods was considered a disadvantage. Lack of commercial success caused Mercer to turn his attention to other matters, without demonstrating any other advantage of the application of caustic soda lyes beyond crimping. The name of mercerization has, however, always clung to all impregnation operations conducted with cotton fabrics in strong caustic soda solutions, as Mercer was considered to be the first man who had demonstrated its possibilities. Although some of his observations had been made also by Prof. Leykauf of Nuremberg about 1847, no complaint followed as this gentleman had not shown any large scale experiments or applications.

Garnier and Depouilli

No development in the treatment of cotton fabrics with caustic soda lyes took place until 1883, when Garnier and Depouilli, two Frenchmen, patented their treatment with this substance for rendering cottons more resistant to goffering. In 1884 the same inventors patented a process for obtaining crimp and crepon effects on half silk goods, through treating the same with strong caustic soda lyes before or after having been printed with pastes for eliminating the effects of the alkali.

In 1885 they reserved to themselves the exclusive right of producing crepons through treating fabrics having silk and cotton threads, wool and cotton threads, cotton threads specially prepared with a reserve, consisting of gum, or of a resin solution of india rubber, with sulphuric acid between 59 and 60° Baumé, or with strong caustic soda lye for a prolonged period of time, where the cotton portion contracted leaving the silk unaffected, producing what was then termed "chemical waves." The reserve was removed through the employment of solvents. The reserve could be applied warp or weft ways, and a variety of contrast effects could be prepared, and the cloth could pass through the lye either in a state of tension or not; the patentees seeming to have nearly recognized the lustering effect.

A third patent was taken in 1885 extending the crimping process, the two manufacturers later making quite good profits with the new styles, the principles of treatment of which are still used.

The Basic Process of H. A. Lowe

The application of tension which made the mercerizing process possible was not discovered until 1889, when H. A. Lowe applied for a patent describing a method for the production of lustre, which is about the same as the present-day method. The next year he followed the patent with a specification clearly describing a method of producing lustre. However, he does not seem fully to have recognized the advantages of his process applied to long stapled cottons, as this does not seem to have been practiced to any great extent until much later. In his experiments Lowe employed a special stretching apparatus, or appliance, where the cotton goods, in piece form, were held under tension. The frame was steeped in a strong caustic soda solution, where the fabric almost immediately essayed to shrink, but could not beyond a certain degree, and when washed under tension retained a certain brilliant lustre.

During the following years the industry was of slow growth, owing to the great scarcity of proper machinery for producing mercerized yarns in quantity, and sufficiently economically. This can be attributed also to the secrecy with which the manufacturers held their process.

The Thomas and Prevost Process

The transformation of the cotton fibre into an article, the aspect of which comes close to that of lustrous silk, only followed on a certain scale in 1895, when the Garnier firm offered Thomas and Prevost, an enterprising firm of Crefeld dyers, their German craping patent, asking 10,000 francs and a royalty. The offer was not accepted and the firm Thomas & Prevost directed its attention to obtaining just the same effect without infringing the patent. In this way they noted that the cloth treated with strong caustic soda lye showed much more affinity for dyestuffs, and when samples of the same were stretched on frames, and submerged in this form in the lye, the material took on a particular brilliance coming near to that of certain silk fabrics. After this observation they repeated the experiment with yarn, and the first mercerizing machine was constructed through their instructions by Gebruder Wansleben, covering the process by different patents. None of such patents mentioned, however, the production of a lustre effect, the patentees aiming still at improvements in two color effects, and they also wanted to prevent the shrinkage of the fibre.

The Process Made Free to All

Other patents taken out later insist particularly and uniquely on the treatment with the strong caustic soda lye for increasing the brilliance or shine of the material. These caused a great sensation among dyers, and manufacturers essayed by various means to appropriate the advantage of the new process, some through purchasing the license of exploitation, and others through modifying the process more or less. Some of the best advised demanded the cancellation of the Thomas & Prevost patent, showing that in their first patent the inventors considered as secondary matters the tension and brilliance obtained, and that they did not aim at lustre, but rather at avoiding shrinkage. Lowe's patent was brought forward as recognizing the advantages of the silk lustre. Thomas and Prevost obtained, however, in 1898 an additional patent with considerable alterations. Their claim was for alterations in the patent of March, 1895, consisting in exerting a very much greater tension on the cotton soaked in lye, so that even hard-twisted, long-stapled cotton could be stretched to its original length, and they claimed most specially the production of a permanent silky lustre. The German courts annulled the Thomas and Prevost patents in 1901 and thus rendered the process quite free later to revolutionize the whole cotton industry, and if the name of mercerization was given to the new process of lustring it was also as a consequence of the above complaints.

Early Skein Mercerizing Machines

Mercerizing was at first confined to yarn in skein form, piece goods mercerizing being applied some years after. The skeins were at first placed on arms fixed at a certain distance apart in a special framing, that was dipped into the strong alkaline bath. A later machine was constructed with a series of arms, that could all be dipped at the same time, enabling a saving of time and labor.

This simple form of hank mercerizing machine was followed later by quite a series of other machines, often possessing special characteristics, that with the course of years were submitted to improvements dictated through practical experience, and tending to cheapen mercerization, facilitating the work of the operatives and rendering more thorough the action of the strong alkaline baths.

Horizontal-Arm Machines

Improved types of hank mercerizing machines had their pairs of stretching arms placed in an horizontal position, and one of the units could be approached for the introduction of the material, or distanced for its stretching through a simple mechanism, easily controlled by the operatives. Below each pair of such arms was placed an impregnation trough containing the strong caustic soda lye, and in which the skeins of cotton yarn could be turned for causing uniform penetration, and then, after their motion had been stopped, for withdrawing the caustic soda, and the replacing of it with clean hot rinsing water, thus extracting enough of the alkali to allow the taking off of the yarn for its further treatment with acid and rinsing water.

On some of these machines the disposition of the arms was so modified that while the troughs remained immovable, the pairs of arms were held in a convenient position while being charged with the skeins, and then raised and lowered into the troughs for the impregnation and rinsing operations, leaving the carrying arms uncovered when entering the lye and the rinsing water.

In other machines several pairs of horizontal stretching arms were caused to revolve around a central mechanism, the hanks of yarn being submerged twice in a stretched condition in the strong alkali, run through squeeze rolls to remove all

excess of alkali, washed, neutralized, again rinsed, and again squeezed. These plants prevented all contact of the operatives with the material while impregnated with the strong alkaline bath. In this case the saturated yarn was washed by jets of the rinsing and neutralizing fluids, which did not, however, always effect the removal of the lye sufficiently and uniformly.

Modern Skein Machines

With some of the most recently introduced machines the spindles of the yarn-carrying-rollers are retained in position laterally during the mercerizing operations instead of being held only in the center and, having swinging ends, and the extreme ends of the yarn carrying rollers are held by a bolting arrangement, which is automatically raised or lowered when the yarn is put on or removed from the rollers. A further improvement consists in the automatic interchange of the lye and neutralization troughs.

In other recent machines the lye trough is carried on connecting rods. These again are supported by a system of cross ties connected with a double lever arrangement which, in turn, moves on a shaft in conjunction with an eccentric disc so as to permit the raising and lowering of the lye trough, giving the latter its lowest position when the water trough is placed under the rollers. The center position is assumed when the neutralizing trough is set in operation, while the top position brings the lye trough immediately under the yarn rollers, in which position the yarn is impregnated with the lye. The water trough is hauled into the machine on rollers by a chain and chain wheel, operated in conjunction with an eccentric disc. These novel features do away with the jet arrangement and cause the lye to be entirely and uniformly washed from the yarn in the neutralization trough.

An automatically opening and closing valve intermittently discharges the concentrated lye through a gutter into a funnel. The funnel itself can be swivelled by means of lever and counterweights to discharge into either of two separate discharge channels, one of which is for lye which can be re-employed, the second carrying the spent washing water.

The overflow union of the neutralization trough is connected to the discharge valve, and the admission of the cold or warm neutralizing fluid is regulated by valves and a distributor so as to give an equal flow to the trough. In this way it is impossible for the lye to be weakened by any dripping from the water connections, and uneven mercerization of the yarn is avoided. The opening and closing of the valves is effected by an eccentric and an adjustable valve rod, by means of which certainty of operation is obtained. The washing water does not pass over the lye trough but directly into the water or neutralization trough, dripping being entirely avoided by this new arrangement.

The squeezing rollers are supported at their ends in such a manner as to effect a thoroughly uniform squeezing of the yarn over the whole surface. The tension rollers are automatically actuated by a lifting mechanism and eccentric, and as the tension rollers are supported not only in the center but also at the ends the tension must always be parallel, thus avoiding many of the disadvantages inherent in machines in which the tension rollers are suspended in the center only. The hourly production of the above class of machines is claimed to be about 72 lbs. of uniform, highly-mercerized yarn of great lustre.

Warp-Yarn Mercerizing

The development of skein mercerizing machines was followed by the introduction of warp mercerizing machines, in which the yarns were treated in a series of iron vats, at the beginning and end of which is always a pair of squeezing rollers. Each compartment contained a certain number of upper and lower guiding rollers. Here the material was treated, first with the strong alkaline lye, and by remaining under a certain tension between the pairs of squeezing rollers and on the guiding rollers shrunk but little, allowing a certain mercerizing action to take place, quite sufficient for some purposes. Passing further along in the machines the warps were treated with boiling rinsing waters that deprived them of the greater part of the alkali remaining in them after the squeezing, and then they were carried through acid baths and through final rinsing waters that prepared them for the operations following. This type of machine has had a limited use in Europe, largely owing to the fact that spinners are accustomed to make deliveries in hank form and weavers and knitters to receive them in that form, and then to wind them on bobbins, tubes, cones or other package form.

Cloth Mercerization

Seeing the favorable results early obtained through yarn mercerizing, several machines for mercerizing cloth were introduced. In one of the earliest of these the cloth passed through the caustic soda lye contained in the trough of a modified three-roller padding machine in such a way that it was kept always stretched on its sides by means of pins or points on the guide rollers. After treatment with the caustic soda the cloth was squeezed between the rollers, and was brought then to the stretching part of the machine where it was stretched to the desired width, being later washed with cold water and treated in weak acidulated water for removing all caustic soda. The production of a similar machine was of 5,000 meters of cloth per day, and it could be employed for treating all classes of fabrics.

At about the same time some manufacturers produced a certain luster by simply using a continuous soaping machine, taking advantage, in this instance, of the tension produced between several pairs of squeezing rollers, and the underlying guiding rollers for avoiding a portion of the shrinkage.

Others impregnated the material on an ordinary padding machine, and the rolls of cloth were then carried to a stretching machine. Here the operatives introduced the cloth between parallel endless chains supplied with clips, that gradually carried through the whole piece stretching it to the wanted width, and delivering it to wash boxes, generally of wood.

This type of machine, although it remained in employment for some years, possessed serious disadvantages. One of these was that the operatives had to introduce the impregnated material by hand. Besides this they had to sew its ends, after the piece had passed nearly through the stenter, to the beginning of a new piece being entered. Moreover, the plant possessed the serious defect that a certain shrinkage followed during the passage of the fabric from the endless chains to the first pair of squeezing rollers of the wash boxes, reducing somewhat the degree of the luster produced. For avoiding this were later introduced much longer stretching machines or stenters, and the padding machine was placed directly in front of the same, so that the material, on leaving this was taken up automatically by the pair of endless chains. After having been brought to its original width, or slightly above the same, it was submitted to the action of a series of sprinklers that sprayed boiling water on its upper portion, the water dropping into a trough below the stenter. In this way after a time no shrinkage could take place, and before the end of the stenter was reached the endless chains relaxed their stretching action, delivering the now unshrinkable fabric to washing and souring vats. This form of stenter, after having been submitted to much improvement in all its portions, is that mostly employed now.

Caustic Recovery

The high price of caustic early caused attention to be given to recovering the alkaline washings obtained during the rinsing of the mercerized cotton fabrics, and in 1907 an English patent was taken out for concentrating apparatus in which the lye could be brought to a strength of between 25 and 50° Tw. Another patent taken out in the same year covered the employment of steam on the stenters for increasing the extraction of the caustic soda and reducing the work in the wash boxes that followed. For this purpose steam was applied on both sides of the material while it passed between squeezing rollers. Another patent mentions the treatment with weak acid baths of the stretched cotton cloth while impregnated with the strong caustic soda lye until complete neutralization, and the further stretching of the cloth with the object of obtaining a higher luster. A stretching machine having three separate portions was recommended for the purpose.

The stenter mercerizing ranges long ago displaced all other forms of cloth machines and since then the changes and improvements introduced in the mercerizing of cotton fabrics have been limited to facilitating the work on these, rendering it as economical as possible, and to improving the means for recovering the caustic soda contained in the water liquors. Such improvements have, however, limited more and more the mercerizing process to plants having the possibility of treating very large quantities of material at a time, and have brought down the cost of the process to very low figures. Padding machines with screw pressure, or lever and weight pressure, have been gradually displaced by water mangles working under hydraulic pressure, and having a shallow and broad impregnation trough, where the cotton cloth is impregnated twice in the strong caustic soda bath, while running on several guiding rollers placed below the same; being also pressed twice, but in such a way as to leave in the cloth entering the stenter only such lye as cannot be extracted without breaking or splitting the material.

The stenter is supplied with chains having nickel plated clips for avoiding the formation of rust stains on the borders of the cloth, and that work automatically, seldom breaking the borders. The rinsing operations are conducted through aspiration cases and multiple sprinklers, the hot water of which is employed over and over again, with the aim of increasing the concentration of the washings produced, and saving in the cost of later caustic soda recovery operations.

Caustic soda recovery has also been given the attention of modern engineers, and it can be conducted at present with plants where the washings produced below the stenter are caused to run into large cement covered collection cisterns, from which they are pumped into large shallow causticizers for their purification with lime and other suitable substances, and brought up in alkali contents through the introduction of carbonate of soda, producing generally caustic soda lyes from 8 to 12° Baumé, that are sufficiently free from impurities for allowing their concentration and employment over and over again.

The concentration of lyes through the advancement of chemical engineering has also been greatly cheapened. For this purpose plants having large evaporation boilers are available at present, working with exhaust steam and a vacuum, and that can bring the lyes to the desired concentration of 30 to 35° Baumé, and even above this, if required, within a short period of time.

In many establishments the mercerizing process has been employed for avoiding the long and costly boiling-out operation conducted with alkaline lyes or enzyme products, by treating the gray cloth just as it arrives from the mill with the strong lye, and with the usual washing and souring liquids.

Raw Material Dominates Cotton Goods in 1923

Big Jump in Cotton During Summer Unexpected by Manufacturers, Who Had Hoped to Buy Their Raw Material at Approximately 18c.—Merchandising Difficulties Cause General Curtailment in Closing Months—Considerable Further Expansion of Southern Industry—Importance of the Ford Mill—Is 30c. Cotton Normal?

THE story of the cotton goods market during 1923 is largely the story of the raw cotton market. Probably never before has the goods situation been so completely dominated by the staple. As the new year opened this dominance was lessened in no degree; the spectre of raw material antics impossible to forsee cast its shadow over the merchandising outlook. King cotton is king indeed.

In brief retrospect 1923 was a year of exceptionally good business during the first three months, with practically all mills running full, or nearly full, on orders which showed normal profits or approximately normal profits. During late March and early April reports of the tremendous acreage of cotton being planted had an immediate and depressing effect on raw material prices, and gray goods started to sag. Buyers of all classes strengthened their policy of close operations which was to feature the rest of the year. With temporary upward reactions prices on gray goods declined steadily from May through July, when the low points for the year were reached.

A gradual upward movement started in August, when it became evident that the cotton crop would be nothing like what early planting reports had indicated. Cotton jumped 7c. a pound in remarkably short order when Government reports indicated the crop would not be much in excess of 10,000,000 bales, and gray goods followed, though not making anything like the same percentage gains as the raw material. Late November saw the highest prices of the year for gray goods. Slight recessions followed in December, but the market closed fairly firm.

A comparison of opening and closing prices on 38½ in. 64x60 5.35 yd. print cloths tells the story of the year better than many paragraphs of words. On Jan. 2, with middling spot cotton in New York quoted at 26.45c., 10⅜c. was the market price on this pivotal construction. It closed the year on Dec. 31 at 11c. for spot goods, with New York spot cotton at 36.70c.

When it is considered that the condition illustrated by these figures existed, to some extent, throughout the last six months of the year, the unsatisfactory market of the last half of the year is fully realized. It has been impossible, in the face of hand-to-mouth operations of most jobbers, converters and cutters-up, to work cotton goods prices up to a basis of replacement costs. Profitable merchandising for many months has been open only to those mills owning cheap cotton, and their number is conceded to be small.

This is the big problem facing the market for the current year, and its solution may hardly be said to be in sight. Most mills probably would hesitate to characterize 1923 as a bad year, yet few will dispute the fact that it was not a good one, except for a comparatively small number of plants where peculiar conditions controlled.

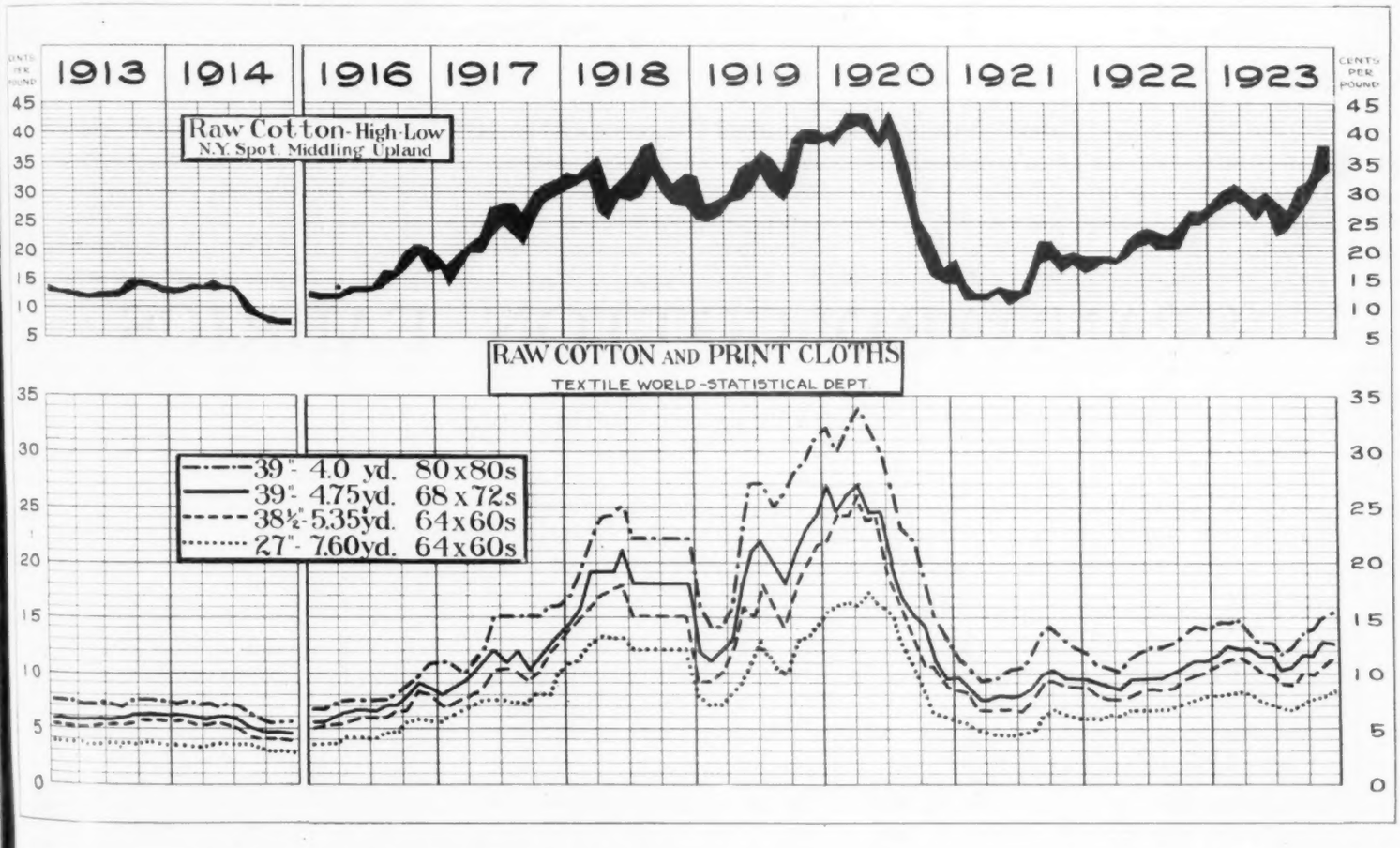
Fundamentals All Strong

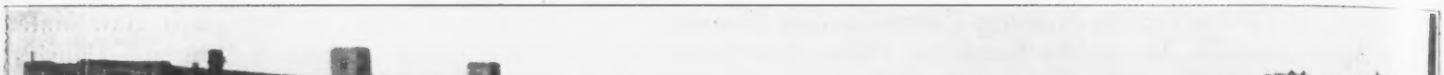
As the current year started every attempt was made by merchants in the primary market to thrust pessimism into the background and to look forward as hopefully as possible to the new twelve month period. There is no denying the fact, however, that extremely few regard the prospects for the first six months of 1924 with any degree of exhilaration. All mercants worth their salt have prepared for a year of unusually hard work, and this in itself augurs well for the results to be accomplished. Back of the market, fortunately, are the strong and healthy fundamental conditions affecting general business the country over—general employment of labor at near-peak wages, and fairly steady, normal consumption of goods.

The market is suffering from conditions peculiar to itself; it is not sharing generally upset or depressed conditions, and such are not likely to develop in the immediate future. There has been no "buyers' strike," and none is in prospect. Resistance to higher prices has come solely from jobbers and retailers—low-priced merchandise is still available to the consumer. And it is very much to be doubted whether the percentage of advance that will be necessary at the retail counter because of higher costs in the primary market will offer much of a bar to normal distribution of merchandise this year.

30c. Cotton Normal?

Old-time merchants in the first





At Left Multi-Story Weaving Mill. At Right 4-Story Dye House. The Bridge connecting them is 1000 ft. long.

Riverside and Dan River Cotton Mills

INCORPORATED

Danville, Virginia

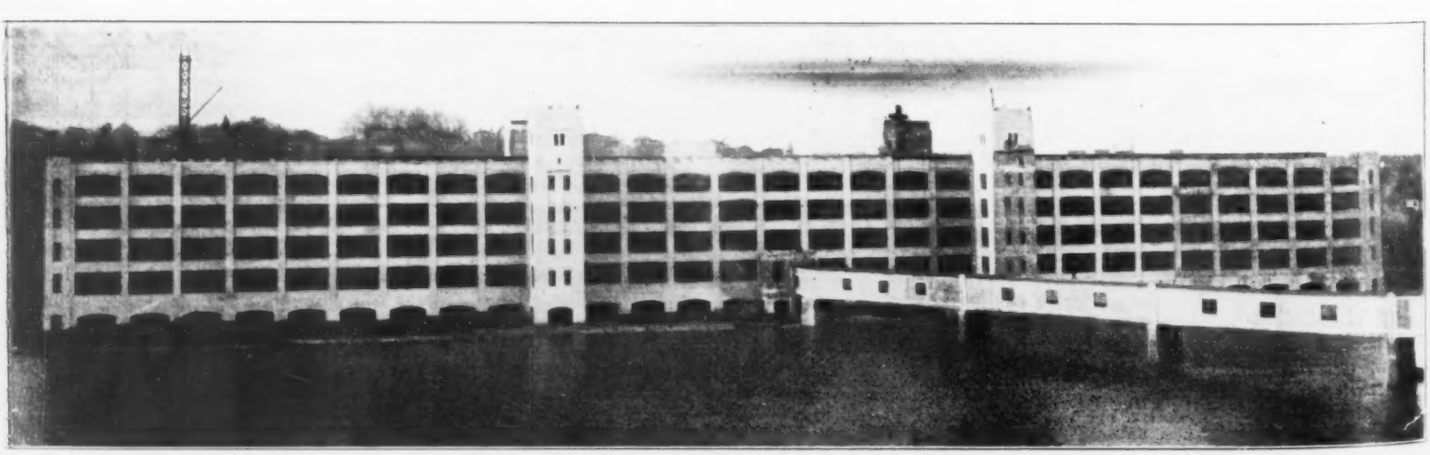
New York Office and Salesroom: 56 Worth St.

Manufacturers of

STANDARD COTTON FABRICS

for the Jobbing and Cutting Trade

Dan River 27" Dress Ginghams—Security 32" Ginghams—Ideal Fine Yarn 28" Chambrays
Riverside 27" Plaids—Golden Rule 28" Chambrays—Defiance 28" Chambrays
Dan River Bleached and Brown Wide Sheetings, Sheets and Pillow Cases



Another View of the New No. 8 Weaving Mill (Shown Above)

hand market are firm in their belief that goods based on higher than 30c. cotton cannot be distributed in volume to consumers in this country. On the other hand there are a few who maintain that those who hold this opinion are living too much in the past and have not yet fully adjusted themselves to new normal price levels resulting from the war.

New standards of living have been adopted generally. Cotton at 30c., considering the influences which contribute to the establishment of this price, is not advanced disproportionately over pre-war levels, in comparison with other raw materials. Far-sighted students claim that 30c. is approximately a normal, stable price for cotton which may be expected to hold for many years.

The fly in the ointment is, of course, that the staple is now appreciably higher, with all indications pointing to still further advances during the present year.

Export Support Lacking

An important contributary cause to what has been described as an unsatisfactory year for practically all staple goods is the considerable decline in exports. The latest figures available are those of the Department of Commerce for the ten months ended November, which show shipments of 429,469,423 sq. yds. of all kinds of cotton goods, valued at $73,359,919 during 1923, which compares with 546,393,583 sq. yds., valued at $78,608,478 shipped abroad during this period in 1922. In this comparison, also, it is well to remember that 1922 was by no means a banner year.

All through 1923 it was found difficult to sell goods for export at the relatively high prices ruling. The decline in unbleached cloths is particularly noticeable, the figures being 95,695,153 sq. yds. for the first 11 months of the year, in comparison with 165,878,377 sq. yds. for the same period in 1922. Manchester was able to undersell the domestic market on practically all classes of merchandise, and generally depressed conditions in the English industry did not make her any less eager to do so.

The export outlook is not encouraging. Those of long experience in this important end of the business say it is impossible to maintain volume at anything like present prices, and there seems little likelihood of sharp reductions during the present year. It is becoming more and more generally accepted that the development of export trade is of vital importance to the health and prosperity of the domestic industry, and yet, despite much discussion and theorizing to this effect little organized effort is being expended by the industry itself to accomplish this result.

Sooner or later, and sooner, it is to be hoped, than later, there must be developed something approaching a cooperative movement with this end in view.

The Big Mistake

It is not within the province or the capacity of this publication to lay down rules for the purchase of raw materials. But it should not be out of place in this brief review to express the hope that the big mistake of 1923 will not be repeated this year. Last spring, under the influence of reports of large acreage, buyers' insistence that they would not pay higher prices for goods and a great volume of bear propaganda, cotton began its downward movement which was to fool everyone. At 27c. cotton buyers said they might buy at 25c.; at 25c. they said they would wait for 23c. cotton, and when the staple reached 23c. they could see nothing but further reductions to 17-18c.

Practically the entire trade anticipated that the new crop would be sold at around 18c., and new prices on prints were issued during the summer with the announcement that they were based on 17c. cotton. But 17-18c. cotton never arrived. After reaching a low of approximately 22c. the decline in the staple was halted, and the upward movement started which was to carry it to within close acquaintance of 38c.

Most mills were caught short. Anticipating a continued decline to the low figure referred to, very little cotton was bought, and the raw material shot up so quickly that it afforded little opportunity to cover at the approximate low for the year. Mills were forced to buy on an advancing market as they needed cotton, and on the bulk production of staple goods they have not yet been able to work their prices up to a basis of replacement cotton.

Bear Propaganda Expected

There may be no moral than can be pointed to in this sudden advance. It is most easily disposed of by referring to it as a typically unexpected change, practically overnight, in a notoriously erratic market. But there are those who feel that 25c. cotton will be a good buy at any time during the next few years — that it will reach that price only because of speculative manipulation and not by reason of natural depressing causes.

As the new year opens it is apparent that a mass of bear propaganda will again flood the market during the early planting season for this year's crop. Much will be made of "intentions to plant," and a record acreage seems probable. But there is no getting away from the results of three short crops in succession, the tangible carryover figures and the fact that a crop materially larger than that of 1923 is not probable until effective means for checking the boll weevil are discovered and put into practice, regardless of the number of acres planted.

High cotton seems fairly certain to be with us for several years to come. A quotation of 25c. for middling may look cheap to shrewd buyers this year.

The Southern Industry

Of major importance among developments during a year singularly bare of outstanding merchandising events was the continued expansion

PRINT CLOTH FLUCTUATIONS

Fluctuations in three of the most active print cloth constructions during 1923 are shown by the figures below, which are taken from the cotton goods chart compiled by Louis Lowinson & Co., New York brokers.

Construction		72x76 39″ 4.25	68x72 39″ 4.75	64x60 38½″ 5.35	Spot Midd. Upland Cotton
Jan.	6..	.....	.....	.....	26.60
"	12..	.....	.....	10½	27.45
"	13..	.....	11⅝	.....	27.80
"	15..	13⅜	.....	.....	27.75
"	18..	13½	11¾	10⅝	28.15
"	19..	.....	11⅞	10¾	28.30
"	20..	.....	12	10⅞	28.40
"	23..	.....	.....	11	28.75
"	24..	.....	.....	.....	28.60
Feb.	1..	13⅛	11¾	10¾	27.40
"	3..	13¼	11⅞	10⅞	28.10
"	6..	.....	12	11	28.65
"	13..	.....	.....	.....	28.05
"	15..	.....	12⅛	11⅛	28.20
"	16..	13½	12¼	.....	28.55
"	21..	.....	12⅜	11¼	29.00
"	27..	.....	12½	.....	30.15
Mar.	1..	.....	12⅝	11⅜	30.40
"	3..	.....	12¾	11½	30.90
"	5..	13⅝	.....	.....	.....
"	8..	.....	.....	11⅜	30.95
"	20..	13¾	.....	.....	31.10
"	21..	.....	12⅝	11¼	30.55
"	23..	13½	12½	11⅛	30.20
"	27..	13⅜	.....	11	29.35
"	28..	13¼	.....	.....	29.20
"	30..	.....	.....	.....	28.85
April	3..	.....	.....	.....	29.30
"	10..	.....	12⅝	.....	29.70
"	11..	13	.....	.....	29.35
"	13..	.....	12¼	.....	.....
"	18..	12¾	12⅛	10¾	29.00
"	19..	.....	.....	10⅝	28.20
"	20..	.....	12	10½	27.60
"	23..	12⅝	.....	.....	28.00
"	24..	12¾	.....	.....	28.05
"	25..	.....	12⅛	10⅝	29.00
"	26..	12⅝	.....	.....	28.85
"	27..	.....	12¼	.....	29.05
"	30..	.....	12	10½	27.85
May	4..	12½	11¾	10	26.95
"	9..	12	11½	9¾	26.55
"	10..	12¼	11½	10	25.65
"	11..	.....	11½	9⅞	25.30
"	15..	.....	11⅜	.....	26.20
"	18..	.....	11¼	.....	27.00
"	22..	12	.....	.....	28.65
"	28..	.....	11½	10	28.75
June	1..	.....	.....	.....	27.55
"	5..	.....	.....	.....	28.00
"	11..	.....	.....	9¾	29.90
"	12..	.....	11⅜	.....	29.70
"	14..	.....	.....	.....	28.40
"	15..	.....	.....	9⅞	29.20
"	16..	.....	.....	.....	29.10
"	21..	.....	.....	.....	28.50
"	22..	.....	.....	9¾	28.90
"	26..	11¾	11½	9½	28.25
"	28..	.....	.....	9½	28.55
July	5..	11⅝	11	.....	27.65
"	7..	11½	10¾	9¼	28.05
"	10..	11¼	10½	9	27.65
"	13..	11½	.....	8⅞	28.00
"	16..	10¾	10¼	8¾	27.55
"	18..	.....	10	.....	27.35
"	19..	11	.....	.....	.....
"	20..	.....	10¼	.....	27.25
"	23..	.....	10	8½	25.40
July	24..	.....	.....	.....	24.65
"	25..	.....	10½	8⅝	23.90
"	26..	.....	10¼	.....	23.55
"	30..	10¾	10	8½	22.50
Aug.	2..	.....	10½	8⅝	23.50
"	6..	.....	10¼	8¾	25.00
"	8..	11	10⅜	.....	24.65
"	10..	.....	10½	.....	24.25
"	13..	.....	.....	8⅞	25.15
"	17..	.....	10⅜	9	25.65
"	20..	.....	10¾	.....	25.50
"	21..	11½	10⅞	.....	25.75
"	22..	.....	.....	.....	25.25
"	23..	.....	.....	9⅛	.....
"	27..	.....	11	.....	25.80
"	28..	.....	.....	9¼	25.45
"	30..	11½	.....	.....	25.60
"	31..	.....	11¼	9½	26.35
Sept.	1..	.....	.....	.....	Ex.clsd.
"	4..	11¾	11⅜	9⅝	25.95
"	6..	.....	.....	9¾	27.35
"	7..	12	11½	10	27.80
"	10..	12½	11¾	10⅛	29.10
"	11..	.....	.....	.....	29.45
"	12..	.....	.....	10¼	29.05
"	14..	12¾	.....	10⅜	28.70
"	17..	.....	.....	.....	30.05
"	18..	13	12	10¼	29.75
"	24..	.....	11¾	10⅛	.....
"	27..	12¾	.....	10	29.45
"	28..	.....	.....	9¾	29.55
Oct.	4..	.....	.....	9¾	29.20
"	5..	.....	11½	.....	28.75
"	8..	12½	11⅜	9½	28.20
"	11..	.....	11½	.....	29.00
"	13..	.....	.....	.....	29.70
"	18..	12¾	.....	9¾	29.80
"	20..	.....	.....	.....	30.30
"	24..	.....	11⅜	9⅞	31.00
"	25..	.....	11¾	10	31.75
"	26..	13	.....	.....	.....
"	27..	.....	.....	10¼	.....
Nov.	2..	.....	12	10½	32.80
"	3..	13⅛	12¼	.....	32.85
"	6..	.....	.....	.....	33.25
"	7..	13¼	12½	10¾	34.50
"	8..	13½	12⅝	10⅞	34.55
"	9..	.....	.....	10¾	33.35
"	13..	.....	12½	10⅞	33.70
"	17..	.....	.....	.....	34.70
"	22..	13⅛	12⅜	.....	35.60
"	24..	13¾	12¾	11	35.80
"	26..	.....	.....	.....	36.15
"	28..	.....	12¾	11¼	37.60
"	30..	14	13	11⅜	37.35
Dec.	4..	.....	12¾	11⅜	36.65
"	5..	.....	12½	11	35.65
"	10..	13¾	.....	10⅞	33.70
"	12..	.....	12¼	11⅛	36.35
"	14..	.....	12½	11	35.00
"	18..	.....	12⅜	10⅞	35.50
"	19..	.....	.....	10¾	35.70
"	21..	13⅜	.....	10⅞	36.40
"	26..	13¾	12¼	11	37.25
"	31..	.....	.....	.....	36.70

Blank spaces indicate quotation unchanged

Consolidated Textile Corporation

B. B. & R. KNIGHT, Inc.

William M. Wood, Director General — A. G. Pierce, Jr., President

Executive Committee: F. K. Rupprecht, Chairman; William M. Wood, Andrew G. Pierce, Jr., Henry L. Tiffany and Edward R. Tinker

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NEW YORK OFFICES—88 WORTH STREET

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Through the affiliation of these corporations there came under one management the operation of

—Nine owned cotton mills in the South.

—The Windsor Print Works of North Adams, Mass.

—The Knight Mills of Rhode Island and Mass.

—A selling organization handling the output of independently-owned mills having a capacity of 350 million yards of cotton textiles annually.

With the recent introduction into Consolidated management of officials and directors of the American Woolen Company another forward step is taken towards the goal always kept in view by Consolidated policy.

THE UTMOST EFFICIENCY IN PRODUCTION AND IN DISTRIBUTION. THE BENEFITS OF SUCH A POLICY ARE SHARED ALIKE BY ITS CUSTOMERS AND BY THOSE IT REPRESENTS.

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Bonham Division, Bonham, Texas.
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Pelham Division, Pelham, Ga.
Pilot Division, Raleigh, N. C.
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B. B. & R. KNIGHT MILLS

Arctic Mill, Arctic, R. I.
Centreville Mill, Centreville, R. I.
Clinton Mill, Woonsocket, R. I.
Dodgeville Mill, Dodgeville, Mass.
Grant Mill, Providence, R. I.
Hebron Mill, Hebronville, Mass.
Natick Mill, Natick, R. I.
Nottingham Mill, Providence, R. I.
Pontiac Mill, Pontiac, R. I.
Royal Mill, Riverpoint, R. I.
Valley Queen Mill, Riverpoint, R. I.
White Rock Mill, Westerly, R. I.

OTHER MILLS

Caraleigh Mills Co., Raleigh, N. C.
Gonzales Cotton Mills Co., Gonzales, Texas.
Guadalupe Valley Cotton Mills, Cuero, Texas.
Neuse Mfg. Co., Neuse, N. C.
Peerless Cotton Mills, Thomaston, Ga.
Postex Cotton Mills, Post, Texas.
Sand Springs Cotton Mill Corporation, Sand Springs, Okla.
Tell City Woolen Mills, Tell City, Ind.
Troy Cotton & Woolen Mfg. Co., Fall River, Mass.
Virginia Cotton Mills, Swepsonville, N. C.
and others.

PONTIAC BLEACHERY, Pontiac, R. I.

WINDSOR PRINT WORKS
North Adams, Mass.

TERRY TEXTILE CORP., New York
Converters of Cotton Fabrics

of the industry in the South. This trend and its causes has been so fully discussed that there is no occasion for comment on it here. A considerable amount of eastern capital went into the South during 1923 in the form of new mills, additions to existing plants and outright purchase of mill properties built up by southern interests. In the original home of cotton manufacture, meanwhile, the industry is marking time, so far as increased productive capacity is concerned.

It requires no great prophetic vision to see a continuance of this southern expansion as long as the existing differential in overhead and manufacturing costs prevails. Many rumors are current regarding new developments along this line now under negotiation, and important announcements of further growth in the South are to be expected during 1924.

A noteworthy feature of the increased facilities in the southern States is the enlarged finishing capacity. A number of important new dyeing, bleaching and finishing plants were announced for the territory below the Mason and Dixon line during 1923, taking care, in some measure, at least, of what has been conceded to be one of the greatest needs of the southern industry.

Mr. Ford's Mill

Undoubtedly the most interesting news of the year to the manufacturing industry was the definite announcement in the fall of plans for the operation of a mill by the Ford Motor Co. The preliminary announcement and details made public since have disclosed only the outline of proposed application of Ford production methods to cotton manufacturing, but this bare outline has been of great interest to the entire trade. The principal economy in processes disclosed thus far is the elimination of picking in the Ford mill now being set up in Detroit, which will run on 1.05 yard sateens to be used as a backing for artificial leather.

Principal criticism of the Ford program so far has been negative. Mill men point out that it is possible to do things in a self-owned mill, running entirely on one construction, to be further processed into a material where the appearance of the cotton goods used is not especially important, which are not possible in a mill operating on a wide range of gray goods of finer constructions to be sold in the gray to extremely exacting buyers.

Aside from the fact that important details of the Ford program have undoubtedly not been made public as yet, the significant point is that this aggressive manufacturing organization, unhampered by tradition and backed by practically unlimited financial resources, has definitely entered upon a program of manufacturing cotton goods. Mr. Ford has accomplished economies and radical changes in manufacturing methods in other subsidiary industries into which he has entered. With the cooperation of a leading organization of textile engineers in his new enterprise at Detroit, it is not unlikely that the results of his latest efforts will be of far-reaching importance to the cotton goods industry.

The Gingham Debacle

Outstanding among the unpleasant features of 1923 was the decline in popular favor of ginghams, and, to a lesser extent, of similar fabrics such as percales. An intimation that all was not well with ginghams was received early in the year when the largest manufacturer announced the restoration of seasonal dating on fall goods, despite the fact that a number of its competitors had already booked good volumes on the terms of 2-10-60 which had been general since the war. At this time a banner year for ginghams was generally anticipated.

It shortly became evident, however, that a definite style trend away from ginghams was in progress, so far as the great mass of goods was concerned. Few mills followed the lead of the big company in granting seasonal dating on fall merchandise, but when prices for this spring were made many of the eastern mills went back to the old terms, though southern mills generally continued to sell 2-10-60.

As the year progressed, and the women of the country refused to continue the gingham vogue which had lasted for several years, merchandise accumulated at mills and through distributing channels. Jobbers' stocks were heavy and practically immovable. Sacrifice prices were made in sections of the primary market and by jobbers all over the country. Mills curtailed radically, and the outlook was most unpromising.

As the year drew to a close, however, indications of improvement in this situation came from many sections of the country. Jobbers began moving their goods in greater volume and lightened stocks naturally occasioned improved sentiment. It is believed that this important branch of the market is now on the road to recovery, though whether or not this will be completely accomplished this year is a matter for conjecture only.

A logical result of the depression in ginghams has been diversification of product in plants which normally run a large number of looms on these goods. Looms were changed over wherever possible and practicable, and new lines of manufacture entered upon by large producers. Whether or not production capacity on ginghams has been increased too rapidly is a question which cannot be answered here, but it is one which is undoubtedly being given a great deal of attention by all market students.

Wash Goods

Flock-dot voiles and dotted swisses were the big features of 1923 in wash goods lines, and they promise to continue in favor during the summer of 1924. Volume was big on these goods during the twelve months under discussion and at least a few converters have probably had record years. Predictions as to "what will be good" this year also include what seems to be a definite trend toward floral designs in prints. Big business has already been booked on aggressively merchandised lines of voiles. In dress ginghams increased popularity is forecast for large plaids.

Blankets

Most lines of cotton blankets enjoyed a good year. This business has made remarkable strides in recent years — on certain lines increases of several hundred percent in volume have been made within a comparatively few years — and the end is certainly not yet in sight. Merchandise is being constantly improved, excellent styling is being done by several mills, and the price appeal of the cotton blanket seems fairly sure of making probable further inroads on the business of all-wool goods.

A noteworthy development of the year was the placing on the market of the first line of printed cotton blankets, made by a special machine, the details of which have not been disclosed. This printing process is understood to be still in process of perfection, but from the progress made to date it is safe to predict a considerable success for the first method of printing heavy napped goods. It should be a manufacturing development of significance.

Bleached Goods

Few will dispute the statement that it has been an unsatisfactory year, on the whole, for bleached goods. Expansion of corporation domination of this end of the business has featured 1923, and the close prices made by their big competitors has made profitable operation difficult for converters. The necessity of distributing large production has made low prices inevitable during a year such as that recently closed. A number of new additions were made to the ranks of sheet and pillow case producers during the year.

Heavy Goods

In heavy colored goods the record of the year seems to have been largely dependent upon the location of manufacturing plants. There seemed to be no difficulty experienced by large sellers in disposing of their total denim production, and these goods were well sold ahead at the start of the new year.

Mixed reports are received regarding duck business during the year, though few selling agents are enthusiastic over what was accomplished. Leading manufacturers of tire fabrics have enjoyed a healthy volume of business, and look forward to expansion of this volume during the present year.

Large Imports

A record of 1923 would not be complete without stressing of the appreciable increase in imports of cotton goods from Great Britain. These imports were largely made up of broadcloths, reverse twist warp stripe sateens, and similar merchandise. The tremendous vogue of "English" broadcloths has by no means abated as this is written.

Imports of unbleached goods during the first 11 months of the year, it is reliably estimated, amounted to about 75,000,000 yards, which is approximately three times the volume of imports during the same period in 1922. Average monthly imports were 6,000,000 yards during the first ten months of last year, but November figures jumped more than 50% over this average. Quotations on English goods at times were 8-10c. a lb. lower than prices of similar fabrics made in the United States.

Progressive Merchandising

Increased attention, verbally, at least, has been paid to technical advancement along the lines of research, improved styling and enlarged sources of design inspiration. To some this appears to be the great opportunity for eastern mills, and it seems certain to be given the larger attention it deserves.

What may be considered one of the most hopeful signs of the year 1923 was the gradual growth of more progressive merchandising policies. Advertising, of itself, is not necessarily an indication of this, but the coupling of sound publicity methods with other aggressive sales methods seems to be gradually on the increase. The record of progress made by pioneers in this field is stirring others to the consideration and adoption of selling ideas which would have been rudely brushed aside ten, or even five years ago.

Satisfaction with what is not being complete, what might be is given greater consideration.

Sales Promotion Ideas

Among the outstanding promotional efforts of the year first place must be given to the selling organization which attempted (with a good measure of success, it is understood) to counteract the general depression in ginghams with unusual sales appeal. Not content to sit back and accept the depression as a necessary evil, this concern, always a leader in styling and merchandising, had a number of model dresses made from its ginghams by leading Parisian designers. These dresses, together with interesting subsidiary exhibits of gingham hats and parasols of similar design, were exhibited by jobbers in many sections of the country, and in a few retail stores. They offered simple and convincing testimony to the attractiveness which intelligent designing can impart to the gingham dress, hitherto hardly a thing of beauty.

Mention should also be made of the mechanical loom exhibits of a well known brand of bleached goods which traveled through many sections of the country, and were promi-

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GREENVILLE, S. C.

52,864 Spindles **2,000 Looms**

Manufacturers of fine and fancy colored tissues, voiles, lawns, mixed silk and cotton dress goods, handkerchief cloths, draperies, etc. Also combed peeler mercerizing twist ball warps.

SELLING AGENTS:

Hunter Mfg. & Commission Co.

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NEW YORK, N. Y.

neatly displayed in the windows of leading retail stores. An interesting exhibit of historical cotton fabrics, together with modern merchandise, also was given considerable display space by retailers in many cities.

The Outlook

To predict accurately the course of the market this year is a task which those best qualified to make predictions dodge without thanks. It is considered not improbable by many that 1924 will reverse 1923, and that a quiet first six months may be succeeded by a conservatively active latter half year. Continued and increased curtailment seems inevitable, by reason of the short crop if not because of sub-normal demand for goods.

Those who may be expecting a radical break in cotton, with permanent levels established below 30c., will do well to concentrate on a study of the boll weevil. It may be helpful, also, to digest all the inferences to be obtained from exports of American cotton this season which, in the second week in January, had reached a total of 3,458,181 bales, compared with 2,987,981 bales exported during the corresponding period last season.

1923 English Cotton Industry

A Difficult Year but Prospects Brighter—High Cotton Prices Make Profits Difficult

By *Frederick W. Tattersall*

THE past twelve months must be described as a very disappointing period for all engaged in the cotton industry of Lancashire. There were hopes at the beginning of 1923 of better times, and optimistic views were somewhat justified as there seemed to be every promise of an increased demand in yarn and cloth. Developments, however, were of an unfavourable character, and spinners, manufacturers, and distributors of goods were hampered at every turn. The business doing from month to month was not sufficient to meet the requirements of producers, and a large amount of machinery had to stand idle for want of work. Sellers were compelled to accept unprofitable prices and numerous firms had to report serious losses. Bright features, however, were not altogether absent and a prominent development during the year was the improvement in the finer end of the industry. Producers of Egyptian yarns gained ground and increased activity also showed itself in fancy cloths of various kinds. The depression continued acute in coarse yarns and amongst makers of the commoner styles of piece goods. Towards the end of the year there was a marked rise in values as a result of the striking upward movement in raw material rates, as cotton prices were over 50 per cent dearer than in the middle of the summer. Once again numerous cases of financial difficulties had to be reported. Probably more failures took place than in any previous year in the history of the trade. There were fears now and again of a financial panic, but such a thing did not happen, and probably in this respect the worst is over. Many spinning mills, however, are feeling the money stringency very acutely. Numerous companies had to make further calls upon the shareholders and several concerns were compelled to reorganise their finances.

Outside Cotton Growths

An interesting development with regard to the use of raw cotton in Lancashire during the year was the larger purchases by spinners of what are known as outside growths. Quite a big business was done in Peruvian cotton and numerous firms are now buying this quality of the raw material that have never used it before. There was also a tendency to consume on a larger scale the higher grades of Indian cotton. It may be taken for granted that this tendency will increase and numerous spinners are more prepared to make experiments with descriptions grown in different parts of the world, especially in the British Dominions.

Cloth Demand Unsatisfactory

The general offtake in cloth from month to month for markets abroad was unsatisfactory. It was, therefore necessary for all manufacturers to allow some of their looms to stand idle and numerous cases were mentioned of weaving sheds being closed down for an indefinite period. Unemployment for the workpeople was rampant, and probably taking the twelve months as a whole, the production was not more than 70 per cent of the full capacity of the machinery. It will, therefore, be understood that makers were unable to secure profitable prices and most firms experienced severe losses. Buyers had no difficulty in obtaining supplies at either cost price or at figures which showed a definite margin on the wrong side.

The year was a very unfortunate one from the point of view of finance. Quite a number of small manufacturers failed, and when weaving sheds were put up for auction they were sold at very poor prices. Agents and merchants also felt the position to a serious extent and probably it was a record year for cases of financial difficulty. On no occasion did our customers buy with any freedom and operations from week to week were very patchy.

In January there was a buying movement of some importance and manufacturers booked orders on a very fair scale. The demand however was not of long duration and the requirements of customers were soon satisfied. Engagements began to run down again and the Cotton Spinners and Manufacturers Association went into the question of organising curtailment of production on a definite scale. The matter was discussed by the district Associations, but it was not found possible to arrange any general scheme, and the proposal fell to the ground. Individual employers therefore, were left to make their own arrangements as to running machinery. Demand throughout the summer was of a very limited character, but in the Autumn the rising tendency of prices stimulated business and the turnover during October and November was much larger than on any previous occasion during the year. It can easily be understood that owing to the severe depression which has existed for three years stocks of manufactured goods were fairly substantial. The recent buying movement however had a considerable effect upon supplies of this kind. Numerous firms obtained very welcome relief and undoubtedly the position of the Manchester market is now healthier than for a long time back. On reference to the Board of Trade returns it will be found that shipments of cloth are about the same as last year, but of course the exports are decidedly smaller than in pre-war years, although our customers are spending more money than formerly on cotton goods.

Indian Demand

Buying of cloth for India during the year was very irregular, and on no occasion was there a sustained demand for any length of time. It may be said however that the position abroad has gradually improved. That great country has had the advantage of two very good monsoons and the grain crops for the past season have been very encouraging. Owing to the continued fall in the cost of living the natives have had more money for the purchase of clothing. It must be pointed out however that cotton cloths are three times dearer than in pre-war days while the earning capacity of the people of India is only slightly larger than in 1913. It cannot be expected, therefore, that Lancashire can do the same amount of business in quantity as formerly. A very favourable development however has been the steady reduction of stocks in the bazaars and dealers in Calcutta, Bombay, Madras, and Karachi have comparatively small supplies on hand, whilst in the up-country districts the stocks are of limited dimensions. In dealing with the different kinds of goods the worst section was that devoted to the production of grey shirtings. Buyers operated very sparingly and many Lancashire producers were compelled to turn their machinery on to other sorts of fabrics.

China Trade

China did not give healthy support to Manchester during the year. Developments in demand were checked by the unfavourable political situation throughout the Far East and traders have waited for the establishment of a stable government. In many parts of the Empire civil war existed and the whole conditions were against business on free lines. Stocks of cotton goods however were steadily reduced, not only in Shanghai and Hong Kong, but also in the up-country districts, and the figures relating to supplies show that the goods on hand in Shanghai are not much more than 50% of the amount held a year ago. During the last month or two inquiry has broadened and in certain quarters more buying has taken place without there being any general flow of orders. It is believed however that a larger turnover will take place before very long as merchants are short of stuff and are being compelled to replenish stocks. Although standard makes were generally slow of sale a very fair business was done in fancies of various kinds, and recently white cloths have been bought on a larger scale. Operations for the minor outlets of the Far East such as Java, Singapore and the Straits Settlements were rather irregular, but considering the conditions the trade done cannot be complained about very much.

Minor Outlets

In some respects the smaller markets of the world did better from the point of view of Lancashire than the larger markets. In this connection a feature of interest was the increasing demand for the United States. Quite a big business was done in printed and dyed cloths, there being active buying in warp sateens, brocades and poplins. This trade was said to be due to the relative prosperity prevailing in America and the fact that manufacturers in the United States were not in a position to produce these fine quality goods. Demand for Egypt was not persistent but towards the end of the year there was a revival of buying and owing to the dearer rates for raw cotton, piece goods dealers in Alexandria and Cairo were in a position to pay higher prices for cloth, Before the war Turkey was one of Lancashire's best markets and there are now indications of trade reviving. For the several outlets of the Levant a fair amount of business was done from month to month.

For a greater part of the year the offtake for the markets of Central and South America was not at all encouraging, but on certain occasions buying took place in finishing cloths. Considering the unsettled conditions in Europe the trade done cannot be called unsatisfactory and a steady business was reported for Switzerland. Some of our Colonies gave fairly encouraging support. In 1922 shipments to Australia were much larger than in any previous year and during 1923 the bigger exports were scarcely maintained.

The Home Trade

It was not a very favourable year for the home trade. The consumption of goods was adversely affected by the large amount of unemployment in the leading industries. In the spring a rather more hopeful feeling prevailed, but owing to the un-

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For the Domestic and Export Trade.

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seasonable weather during the summer. Clearances in light fancy materials did not come up to expectations, and many of the wholesale and retail establishments were left with fairly large stocks. For a long time buyers were afraid to place substantial contracts with manufacturers but the hardening movement in values forced out more orders. There was a good deal of unemployment in the allied trades of calico printing, bleaching and dyeing, and the output was much below the full capacity of the works. There was a tendency to reduce prices for these processes but charges are still much higher than in pre-war times.

Dispute With Dyers

Early in October the Piece Dyers' Association offered a reduction in prices of 10% conditional on merchants placing all their orders with members of the Association. The Shipping Merchants' Committee of the Manchester Chamber of Commerce dealt with this proposal and the merchants at a mass meeting decided to reject the scheme, it being held that the Piece Dyers' Association wanted to create a monopoly. The dispute was settled at the end of November by the dyers granting a reduction of 7½% and a special discount according to the amount of business done.

The following table gives the exports of cotton cloth from Great Britain for the last eleven years:

	YARDS.	£
1913	7,075,252,000	97,775,855
1914	5,735,744,500	79,175,171
1915	4,748,452,900	64,691,328
1916	5,254,222,700	88,787,890
1917	4,978,237,900	112,810,497
1918	3,699,252,300	138,516,962
1919	3,528,756,500	178,955,943
	Square Yards	
1920	4,435,405,000	315,717,631
1921	2,902,659,000	137,168,336
1922	4,181,176,300	142,415,686
1923	4,141,303,700	138,354,133

The following is a list of cloth quotations during the past twelve months on particular dates:

1923	32-in. Printers 116 yds. 16 x 16 32's & 50's	36-in. Shirtings 76 yds. 19 x 19 32's & 40's	38-in. Shirtings 38 yds. 18 x 16 10 lb.	39-in. Shirtings 37½ yds. 16 x 15 8¼ lb.
	s. d.	s. d.	s. d.	s. d.
Jan. 5	34.3	33.9	18.6	17. 0
Feb. 2	34.6	34.6	19.6	17. 3
Mch. 2	32.0	35.6	18.9	17. 9
April 6	33.9	36.6	18.9	17. 6
May 4	32.0	36.0	18.0	16. 9
June 1	34.6	37.3	18.9	17. 3
July 6	32.0	35.0	18.9	16.10½
Aug. 3	29.6	32.9	18.0	16. 0
Sept. 7	31.6	34.9	18.6	17. 3
Oct. 5	32.6	36.6	19.3	17. 9
Nov. 2	34.0	37.9	20.0	18. 9
Dec. 7	39.0	42.0	23.0	20. 3
Dec. 27	39.9	42.0	23.6	20. 9

Depression in Spinning

It should be remembered that the cotton spining trade in Lancashire is divided into two sections. In round figures the mills that use American cotton have about 40,000,000 spindles, whilst the factories producing Egyptian yarns contain about 16,000,000 spindles. In the finer end of this branch of the industry, that is to say Egyptian spinning, there was a steady improvement during the year. Demand tended to broaden and several months ago all the mills in Bolton and district began to run full time. The better state of affairs was maintained and most of the companies engaged in this department of the trade are now making profits. This development was due to the distinct improvement in the turnover in fancy cloths of various kinds.

With regard to the American section the position was deplorable. At the beginning of the year the mills were working only 35 hours a week instead of 48. Rather more trade was done in January and it was decided to abandon the short time movement. The better state of affairs was very short lived and in March the Masters Federation decided to recommend all employers to restrict output by 50%. This short time movement remained in force up to the end of November. A new ballot was then taken, the proposal being that firms should work either 32 or 24 hours a week instead of the usual 48. The vote on being taken showed that the necessary majority in favour of either scheme had not been obtained and the owners of factories are now producing as they think fit. More mills are running full time and it is estimated that the output is about 75% of the full production. Throughout the year spinners of American yarns did very badly indeed. More companies had to make calls upon shareholders and a few cases were reported of special financial arrangements being necessary to surmount the difficulties met with. There were fears of more companies going into liquidation and although in one sense a crisis was pending no very serious consequences were experienced. Many shareholders got into trouble as they were unable to meet the calls demanded. Since October the demand for American yarns has broadened. Spinners were enabled to clear their stocks and some mills have now fair order lists. The consumption of twist and weft at home was very seriously affected by the large number of looms standing idle in North and North East Lancashire.

Shipping Yarns

The general offtake in yarns suitable for shipping was disappointing. The Board of Trade returns showed decidedly smaller exports than in 1922. The falling off was very largely due to the decline in the takings of Continental countries, such as the Netherlands. On certain occasions India bought fairly well but as a rule the offers from Bombay were very low, and it was very difficult to fix a price basis on which to do business. Extra hards attracted a fair amount of attention for the Near East.

The following table gives the exports of yarn from Great Britain for the past eleven years:

	Lbs.	£.
1913	210,099,000	15,006,291
1914	178,496,800	11,973,236
1915	188,169,200	10,314,904
1916	172,170,600	13,428,897
1917	133,151,300	16,695,194
1918	101,711,400	21,389,140
1919	162,665,500	33,911,554
1920	147,432,400	47,685,814
1921	145,904,900	23,928,459
1922	201,220,800	26,436,489
1923	145,019,500	21,011,911

The following is a list of cotton and yarn quotations for the past twelve months:

1923	Cotton Fully Middl'g Amer.	American Yarns 32's Twist	40's Weft	50's Weft	Cotton F. G. Fair Sakellaridis Egyt'n	Egyptian Yarn 60's Twist
	d.	d.	d.	d.	d.	d.
Jan. 5	15.11	21	20¼	23½	17.50	28
Feb. 2	15.38	21½	21¼	24¼	17.65	28
Mch. 2	16.54	22	21½	24½	17.50	28
Apr. 6	15.98	23¼	23¾	25½	17.40	29
May 4	14.88	22¾	22½	25¼	16.40	28½
June 1	16.06	23¾	23½	26¼	16.40	29
July 6	15.77	22¾	22¾	25	15.75	28½
Aug. 3	13.86	20	20	22¼	15.85	28
Sept. 7	16.22	22	22	24½	17.05	29
Oct. 5	16.84	22¾	22¾	25½	18.60	30½
Nov. 2	17.79	24	24¼	27	18.75	30½
Dec. 7	19.92	27¾	28	30¾	24.15	38
Dec. 27	21.28	28½	28½	31¼	24.50	38

Proposed Control

The Emergency Cotton Committee which was formed in Oct. 1922 continued its activities. It agitated for some system of control in the spinning branch of the industry, the idea being to limit production according to the state of demand and in this way to check the selling of yarn at a loss. The Masters Federation was urged to adopt a policy of this kind and owing to pressure a ballot of the members on the question was taken last June. The result showed that less than half the employers were in favour of the proposal and the matter was then dropped. Early in October the Lord Mayor of Manchester called a conference in the Manchester Town Hall of representatives of the employers associations and trade unions in the cotton trade to consider the depression. After a very full discussion it was decided to form a committee of equal numbers of masters and operatives for the purpose of ascertaining whether any practical steps could be formulated for the betterment of the trade. Many meetings were held and the committee centred its attention on the question of control. Early in November there were rumours that unanimity had been obtained but at a special meeting of Egyptian spinners it was decided by that section to oppose any form of control or the payment of levies. This decision made it impossible for the committee to proceed and discussions are now taking place as to whether it is desirable to control the industry on a sectional basis. Those in the industry who are best qualified to know the position of affairs are of opinion that no scheme of control will be accepted by the trade.

Labour Matters

Throughout the year no important question arose with regard to labour matters. The wages agreement between the employers and the workpeople which was in operation at the beginning of 1923 provided for no further alteration in list rates before May. A few weeks before the agreement expired the trade union officials suggested to the employers that the agreement should be extended for twelve months without any change in list rates. Several joint conferences took place and in May a fresh agreement was arranged which provided for rates of wages to be unaltered until Jan. 25, 1924. After that date the employers will be at liberty to take whatever action they think fit on giving one month's notice. The operatives organizations however, are not allowed to make an application for a general advance in wages before Sept. 25, 1924.

Cotton Mill Shares

The cotton mill share market throughout the year presented a very irregular appearance. There was a tendency for values to ease. During the last few months the directors of more concerns have made calls upon shareholders and the fear of more of this sort of thing had an adverse effect upon share quotations. A few companies were compelled to reorganize their finances. Some people are of opinion that the time is an opportune one for securing cheap lots but trade will have to improve to a further extent before there is likely to be any real buying movement in the share market.

The following is a table of leading mill companies showing the share price at the beginning and end of the year. In each case the shares are of the nominal value of £1 with 10/- paid up.

	Jan. 5, 1923	Dec. 27, 1923	Fall
	s. d.	s. d.	s. d.
Arkwright (Rochdale)	7. 9	2. 7½	5. 1½
Boundary (Oldham)	2. 1½	1. 3	—.10½
Cairo (Oldham)	6. 6	4. 4½	2. 1½
Delta (Oldham)	2. 9	1. 7½	—. 4½
Ena (Atherton)	2. 6	1. 6	1. 0
Fern (Oldham)	7. 9	5.10½	1.10½
Grosvenors (Oldham)	3. 4½	1.10½	1. 6
Hartford (Oldham)	10. 3	7. 0	3. 3
Ivy (Farnworth)	2. 9	2. 4½	—. 4½
Lees Brook (Oldham)	2.10½	2. 0	—.10½
Mala (Middleton Jct.)	7. 0	6.10½	—. 1½
New York (Heywood)	3. 6	3. 0	2. 6
Oldham Twist (Oldham)	7. 9	4. 3	3. 6
Parkside (Oldham)	9. 1½	3. 4½	5. 9
Ram (Oldham)	2. 1¼	1. 6	—. 7½
Stockport (Stockport)	6. 1½	5. 0	1. 1½
Townley (Middleton)	8. 0	5. 6	2. 6
United (Oldham)	5. 6	3. 3	2. 3
Wellfield (Rochdale)	7. 8	6	3. 0
West End (Oldham)	9. 2	4. 6	1. 3

Prospects

The general trade outlook at the present time is undoubtedly brighter than for a couple of years back. The most encouraging feature is that stocks of manufactured cotton goods, not only in this country, but throughout the world, are comparatively low. Throughout the past year buying has been of a hand to mouth character, and there has been a tendency to adopt a "short" policy. The restriction of production by stopping machinery has kept down supplies. There are now distinct indications of dealers abroad being compelled to operate more freely. Prices are on a high level, and it is feared that with American cotton at 20d per lb. against less than 7d a lb. in pre-war days, it will be very difficult for Lancashire manufacturers to do a really big trade with its chief customers who of course are the poorest people in the world and chiefly in the East and Far East. There is ground for believing however, that the worst of the depression is over, and employers and operatives may look forward to 1924 as there is every probability of more profitable trade and increased employment for the workpeople. There is a danger of a shortage of operatives if demand broadens out on a large scale as during the last two or three years parents of young persons have not been inclined to put their children into the cotton trade, and there is a possibility of a shortage of youths and girls. The mill share market has recently displayed a better tone.

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Change from Last Year's Conditions in Yarn Market

Little Buying Ahead and Lack of Speculation as 1924 Opens—Dealers Who Operated Freely at Opening of 1923 Now Proceeding Cautiously—Buyers Not Anticipating in View of Possible Decline—Year Unprofitable for Spinners

At the close of 1922, dealers in the yarn selling markets were doing an active business. Sales involved shipment ahead for a considerable period, while operations at the mills were made with the idea of holding the yarn thus bought for a profit or of satisfying a demand that seemed to be of healthy proportions. This condition continued well into the spring, with the result that spinners were well supplied with orders and were able to operate machinery in full and frequently overtime. During this period, prices showed an advancing tendency and apparently dealers were justified in operations of substantial character based on possibilities of profit. During the summer, however, there was a vertical decline in cotton followed by a similar reduction in cotton yarns. Fully 15c. a lb. marked the difference between the high and low of the market within a period of three or four months. The low point was touched in late July and early August. On 20s 2-ply carded warps, which touched 55c. in March, the price during mid-summer went as low as 40c. The price of other yarns followed this typical count and the market was more or less demoralized.

Current Status Unspeculative

The above description of the early months of 1923 in the yarn market is given for the purpose of demonstrating the diametrically opposite conditions which seem to obtain as the year 1924 opens and to prophesy that there will be no repetition of such a depreciation in the value of stocks as occurred a year ago. In the first place, dealers' stocks at the end of the year were reduced to a minimum and at the high prices for yarn there has been little incentive to operate with the mills in any considerable way. There is a decided difference between operating ahead on yarn costing 40c. and of doing business on the same count when the price has risen to 55c., which is practically the quotation today for 20's 2-ply warps. This opinion is held not only by dealers but by yarn consumers as well and the consequence is that there is very little business booked ahead. There is no doubt that the buyer looks for a repetition of 1923. He rightfully regards the cotton and yarn markets as unduly high and anticipates the depressive effect of acreage estimates when they make their appearance next March. There is nothing, however, in the statistical position to warrant the belief in any such vertical drop as occurred during the summer of 1923. With both dealer and consumer getting along with the smallest limit of stocks possible there is little of a speculative reaction likely to occur. It may be that cotton will go off more or less when large acreage figures are announced, but it would seem as though the unfilled void will be of sufficient size to produce active operations upon moderate declines, which will have the effect of increasing the strength of the market on yarns.

Year Unprofitable

The year 1923 has not been a profitable one for the spinner, taken as a whole. Although as intimated above, early purchases were more or less free and at advancing prices, these advances were not commensurate for the most part with the appreciation in raw material. There has been little incentive at any time for manufacturers to buy liberally of cotton. The spinner has been in very much the same position as the consumer. He has been led to believe that prices were too high. Therefore, it was only logical that he should buy in a hand-to-mouth manner. Consequently he has not had at any time what could be called a large stock of cheap cotton, compared with the current prices of raw material. As a result it has been almost impossible to secure replacement costs on his product, and often times it has been necessary, in order to keep mills running, to sell yarn at a loss.

Variation Between Prices

The course of the market during the year has been such as to make impossible the securing of spinners' prices by the dealer. Frequently the difference between the figures at which dealers marketed yarns and the levels at which they were forced to buy amounted to 4 or 5c. a lb. The practice of buying yarn for their own account and holding it for a profit, which sometimes was realized and again was not, has probably been more universal this year than ever before. Dealers have realized to an increasing extent the necessity of having stock on hand with which to supply their customers. As a matter of fact, unless this stock was available for prompt shipment, business was frequently lost for it was impossible to accept orders at the spinner's price. On an advancing market it is only natural that the spinner should be above the quotations current in the selling markets, but with the diminishing stocks in dealers' hands these figures have tended to approximate each other and at the end of the year the two figures were probably closer together than they have been for a long time.

Short Sales Disastrous

With the upward move in prices of yarn after the middle of the year, dealers continued to try to sell below spinners' levels with the consequence that in certain important instances they were confronted with decided losses. It has not been a year for a large amount of short selling but at the same time the practice has been indulged in to a certain extent. Those who have fought the market as it went up have done so to their own discomfort for the most part. The situation at this writing is unusually inimical to such a procedure. What it may be within three months, however, is another question, for if cotton should show any weakening affect as a result of acreage reports, the possibilities of selling short would be decidedly increased. The seller who has tried to conduct his business on conservative lines, eliminating the factor of speculation, has been confronted a good many times with the impossibility of interesting his trade at anything but prices which would permit him to break more than even. While the explanation has been in certain instances that the dealer has been willing to dispose of his stock of yarn at prices which meant no profit, yet on the other hand it was not infrequently necessary to conclude that orders had been taken which were impossible to cover with the spinner. During the last few months of 1923, this was one of the potent influences in causing an advance in the market. Spinners realized that there was a short interest of considerable extent and they determined to make the dealer pay the piper. The consequence was not only a loss to the latter but a radical advance in market levels.

Consumers Deciding Factor

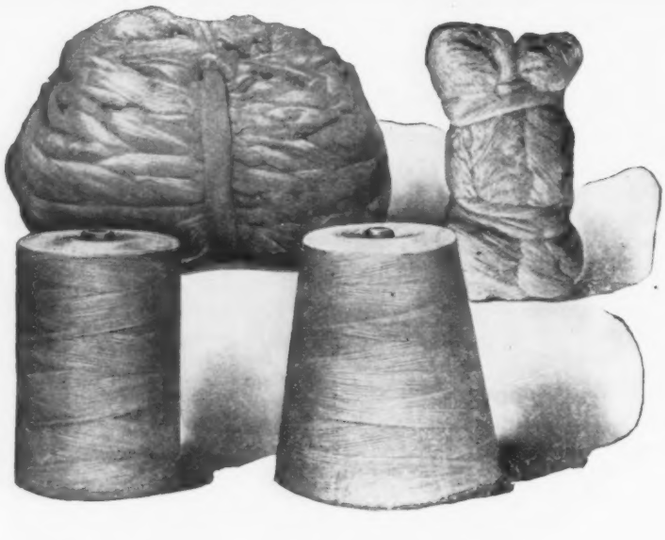
The operations of yarn buyers have been based for the most part, and naturally, upon their ability or inability to sell their finished product. During the latter part of the year it has been largely on the side of inability, with the consequence that trading since December has been of hand-to-mouth proportions with little interest shown by buyers who usually are willing to contract ahead to a decided degree but who under existing conditions have determined to wait until they could determine how their customers would operate. This is particularly true of the knit goods trade, especially underwear. A year ago the knitter was able to market his product with comparatively little difficulty, although meeting with more or less competition from the South. Nevertheless, there was a market for what he produced. It is true that he did not satisfy his full season's requirements and as a consequence had to pay more for at least half of what he bought than would have been necessary had he anticipated his needs for the entire season. This year the outlook is for even less anticipation than usual, but it is not in the nature of speculative retrenchment in the matter of purchases, hoping thereby to secure a more profitable figure on yarn which he knows he must purchase sooner or later. At the present there is no certainty that he can operate his mill, nor on what basis. This accounts for the absolute lack of interest evinced by the knitter.

Nor is this class of buyer the only consumer of yarn who is affected, both with regard to his current operations and his preparations for the future, by the status of his own business. To a greater or less extent this situation is true of the webbing trade of New England, of the towel trade of Philadelphia and of the dress goods trade of the same place. With curtailment of operations and accumulation of stocks, these industries have not been active purchasers at any time during the year. They have managed to operate in part with a minimum supply of yarn, buying lots as they absolutely needed them to prevent a shut-down and at prices which were not economical compared with the opportunities presented at certain periods of the year.

Wire Trade a Mainstay

The electrical wire trade has been in all probability the mainstay of the cotton yarn market. Buyers of important concerns in this division have a reputation for being shrewd operators and their comparative prominence as purchasers has made their business needs a subject for decided consideration by the seller. The consequence has been that there has been spirited competition for this business, with the result not always to the benefit of the seller. On several occasions buyers for electrical houses have come into the market at the psychological moment, at least for their own benefit, and have purchased yarn at prices from which there was a marked advance almost immediately. In certain cases, operations with this trade have been the result of short selling and the business as it finally worked out has not been a profitable one to the seller. At the same time, the building operations of the country have been large enough to create a continuous demand for electrical wire and the seller has taken advantage of this demand to cultivate this class of trade.

The high prices at which yarn has sold during a good part of the year, and especially toward the close, have meant the substitution of other numbers for those usually taken by specific trades. The wire trade has



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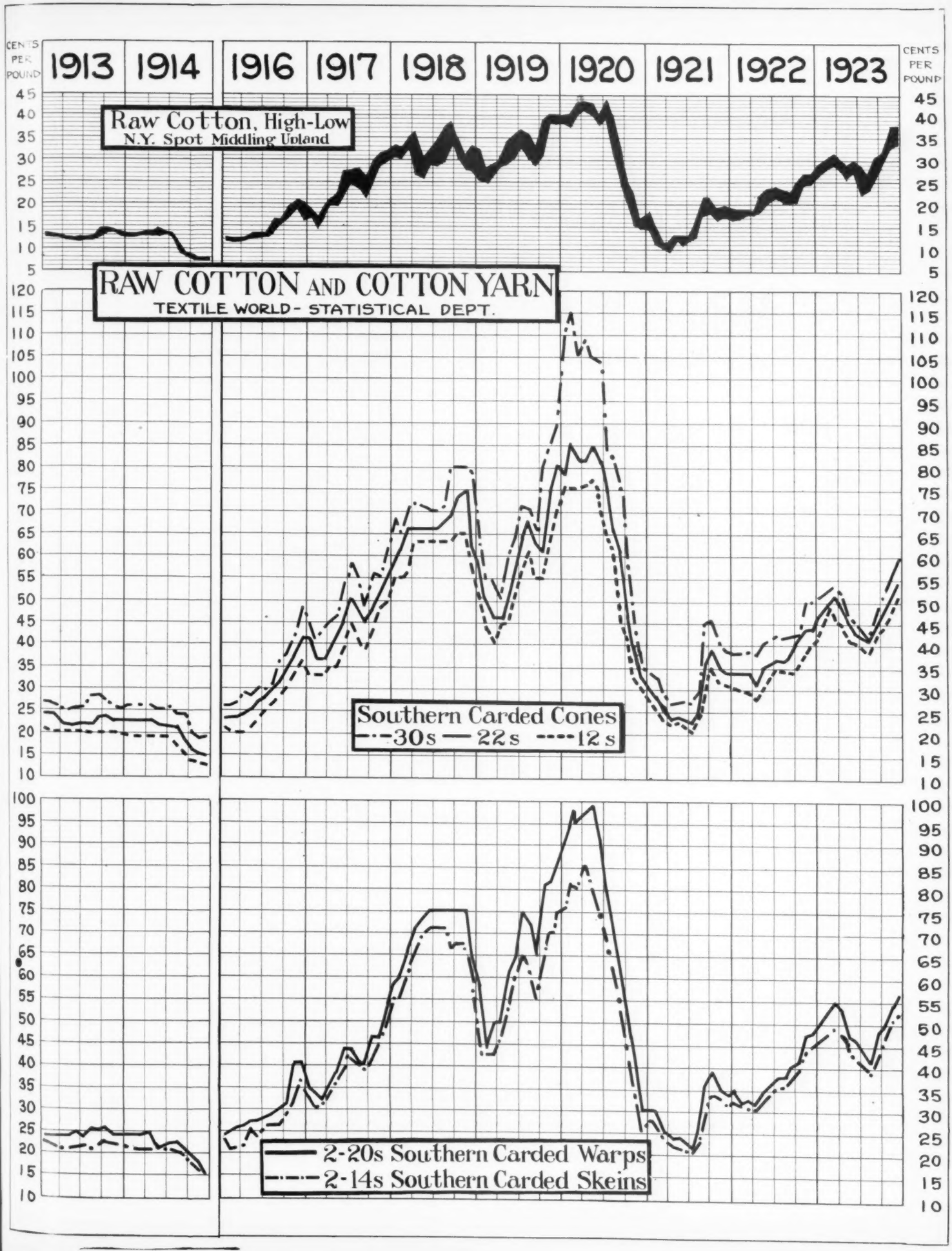
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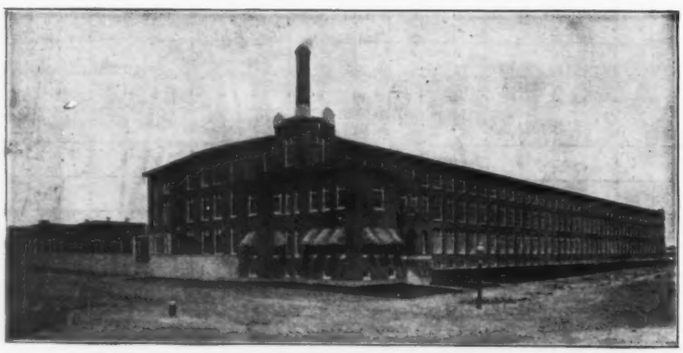

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changed this specification in a number of instances while knitters have been taking different counts from those formerly used. In the latter trade, a number of mills formerly regarded as headquarters for certain numbers have gone off of these numbers entirely, some transferring their operations to hard twisted yarns and others making different counts than formerly. These changes, however, in the spinning industry have apparently had no effect upon the knitter, who has not changed his method of operations in any regard and seemingly has no apprehension as to his ability to secure what he wants, as he wants it.

Question of Curtailment

During the majority of 1923, spinning mills have been operated to capacity and at times on double shifts. Even though there has been little profit in the sale of their product, spinners have been enabled to run their machinery, feeling as a general rule that it was more to their interest to keep spindles in operation, even though practically exchanging a new dollar for an old one, than shutting down and the consequent disintegration of organizations. As the year opens, there is a feeling that unless the current hand-to-mouth character of business is changed in the near future, spinners must effect a considerable curtailment or be confronted with an accumulation that will be disastrous. Curtailment in other lines, and particularly in New England, has not so far been followed by the southern spinner but late reports received from the latter, although designed to disguise the fact that business will be needed in the near future, are nevertheless evidence of necessitous conditions. There is a lack of independence that frequently marks spinners' correspondence and while denying any need of shut-down and claiming orders ahead on their books, the situation cannot be otherwise than more or less critical for a good many, should they continue to operate on full time. The necessity for operating continuously is not generally as great as it used to be when spinners were compelled by financial reasons to keep their machinery running. Under former conditions, shut-downs meant inability to obtain advances on consignments. Today little yarn is consigned and the spinner is in much better position to finance himself locally than used to be the case. This in large measure is the reason why lack of business is not followed immediately by general curtailment. Nevertheless there comes a time when the spinner is compelled, from the standpoint of self-preservation, to effect a curtailment and many feel it is only a question of how soon this may be the condition confronting the industry.

Difficult Year for Fine Yarns

Spinners Faced With Impossibility of Getting Prices Proportionate With Raw Cotton

COMBED yarns have experienced a rather unfavorable year from the viewpoint of the spinner. Production throughout the larger part has been in excess of requirements by manufacturers, with a resultant effect upon prices. Spinners claim yarns have sold during a major portion of the year at prices which allowed them little or no profit based on current long staple cotton quotations. It is said the average spinner will be able to add very little to his surplus as a result of 1923 business. Orders were taken frequently at actual cost to spinners to prevent closing of their plants, notwithstanding this curtailment was a common occurrence, particularly during the latter months of the year.

The beginning of 1923 found combed yarns in an uncertain condition. Demand was light, with a consequent effect upon quotations. Spinners were quoting 40s-2 average quality at 78c; 60s-2 at $1.00 and 80s-2 at $1.25. At this time many eastern spinners had turned to the production of carded yarns, several spinning more carded than combed. Southern spinners were said to be better covered with orders than eastern mills with prices steadier and the quotation range narrower. The knit goods trades were buying in good volume on a basis of 56 to 60c. for 18s cones. In February prices were approximately 5% below the January average, 60s-2, average quality, being available at 95c., caused by a continued lack of interest among buyers. In March and April raw cotton fluctuated considerably, with the general trend toward lower prices. This caused a further weakening of combed quotations at this time. Lower figures however had little effect upon buyers. Their attitude toward the yarn market was the same as that of spinners toward raw cotton; they merely covered their immediate needs and refused to operate for the future.

Sales Continue Small

A few buyers placed good sized orders for delivery during the fall months when a particularly low price was offered to them, which meant spinners would have to sell on the basis of new crop prices rather than the old. Yarns could be purchased at 73c. for 40s-2 average quality; 92c. for 60s-2 and $1.20 for 80s-2 late in April. Little interest was displayed in single knitting yarns, prices being on a basis of 58c. for 18s single cones, with stock lots obtainable lower. Values at this time followed raw cotton closely, which fluctuated radically. Lower prices had little effect upon demand and sales continued in small volume. Interest in combed yarns at this time was better than for carded, due to the fact that manufacturers had allowed their stocks of these yarns to become low, making a continual purchase of small amounts necessary as manufacturers had a fair number of orders.

The margin between old and new crop prices then began to diminish. When an inquiry was made buyers felt they should be entitled to the lower prices of the new crop, while spinners were compelled to quote on the old basis. A difference of 4 to 5c. between May cotton and the later months made buyers hesitant in making commitments even where concessions were offered them. In May it was possible to obtain 60s-2 average yarn at 85c. and 18 single cones at 52c. At this time several spinners, both in the South and East, decided to close their plants temporarily to prevent an over production while demand was below normal. In June an increased interest was displayed by hosiery mills who placed orders for 18s, 20s and 30s single cones in fair amounts, on a basis of 54c. for 24s. During July curtailment was extensive among spinners, the majority closing for a week over the July 4th holiday period with part time general during the rest of this month. When buying was practically non-existent it was reported a large mercerizer came into the market and purchased large amounts at the low level then current. Prices quoted at this time were 80c. for 60s-2 and 50c. for 18s single cones, although orders were placed for 60s at 75c. in many instances.

Spinners' Close Margin

In August spot cotton was selling at 22½c., while 60s-2 sold at 75c.; a year previous they were quoted at $1.00 when spot cotton was 21½c. This illustrates the close margin on which combed spinners were accepting business, when many single combed yarns sold at higher prices than two-ply mercerizing twist yarn. Coarse two-ply yarns were softer in price due to the fact spinners needed new orders on these numbers more than on finer counts. In September quotations were raised several cents a pound in sympathy with advances in cotton; 60s-2 were quoted at 85c. and 90 to 95c. for better grades of yarn; 18s single cones sold at 56 to 58c. depending on the quality. Long staple cotton was now rising, making increase in yarns imperative because of the close margins on which spinners were compelled to operate.

Little change in quotations or in interest shown by buyers was apparent until early in November, when further advances became necessary because of a rapid increase in cotton prices, although combed spinners were not able to raise their quotations to the same degree long staple cotton increased during this time, while carded yarns were increased 4 or 5c. a pound or about the same rise raw cotton experienced. In November 60s-2 were priced at $1.00 for average grades, while best qualities of 18c single cones sold at 60c. Spinners claimed selling prices were actual cost of manufacture to them in many instances, as long staple cotton had advanced so that the higher quotations benefitted few of them. For example they said it cost them 66 to 67c. to spin 20s-2 combed skeins of average quality, which was the selling price to manufacturers, with other counts selling on the same level. The end of the year found buyers continuing a waiting policy, purchasing small quantities frequently rather than placing future contracts. Prices now were 80 to 82c. for 40s-2; 95 to $1.00 for 60s-2; $1.20 to $1.30 for 80s-2; 62 to 63c. for 18s single cones. These prices are similar in many respects to those prevalent at the beginning of the year, although long staple cotton was approximately 7c. higher in December than at the start of the year.

Mercerized Yarns

Price trends of mercerized yarns generally followed the movements of yarns in the gray, with the rule being for buyers to demand immediate benefit from decreases while mercerizers, like spinners, found it difficult to secure higher prices when advances occurred. In January mercerizers reported specifications slow in coming from their customers; they in turn were compelled to hold up deliveries on gray yarn contracts. Prices were weak with new business difficult to locate. Mercerized cones were sold at 79c. for 26s-2; 95c. for 40s-2; $1.18 for 60s-2 and $1.45 for 80s-2. This condition continued during February and March, when prices fell slightly as seen in the quotation of $1.15 on 60s. Due to the drop in raw cotton with its resultant effect upon gray yarn quotations, mercerizers generally reduced their prices in April to a lower basis. It was possible to buy 40s-2 at 88c.; 50s-2 at 95c to $1.00 and 60s-2 at $1.10 to $1.15.

The weakness manifested in the cotton market and yarns had a like effect upon mercerized quotations during May when prices fell five cents in many instances. Notwithstanding the weakness in prices, consumption continued on a fairly good scale during this time, manufacturers using up yarns purchased several months previous. Many factors refused at this time to take sacrifice prices and instances where offers of $1.30 for 70s-2 were refused were numerous. During June, yarns used in making misses' and boys' ribs were in good demand, 26s-2, 30s-2 and 40s-2 being the number used. Quotations of 60s-2 now were $1.05, although orders were placed at 98c. in some cases.

In August a further decline occured, 60s-2 reaching 95c., although the latter part of the month saw an increase in buying with prices slightly firmer. Business was placed in good volume to run until the latter part of the year. During the fall

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months business was spotty; mercerizers made good sales one week and the next would be practically barren of results. The majority of buyers followed a conservative method of buying, preferring to order as needed rather than to place contracts, with an added advantage that they were usually able to secure stock lots cheaper by several cents than they could have placed the business with mills. Quotations late in December were 96c. to $1.00 for 40s-2; $1.15 to $1.25 for 60s-2 and $1.42 to $1.57 for 80s-2. Due to the unsteady demand for hosiery of this character, mercerized yarn business for the entire year was spotty, being good for short periods and only fair or poor for longer intervals. As manufacturers have allowed their orders and stocks to become low in most instances, mercerizers look for an increase in contracts early this year.

Short Supply Boosts Cotton Prices

Effect on Goods Consumption a Factor—Statistical Position Strong at Year End

THE developments of the year 1923 in the cotton trade have not only emphasized the necessity of prices high enough to stimulate production, but have raised a question as to whether such a price will not inculate habits of greater economy in the use of cotton goods. And, unless the boll weevil can be mastered, whether the working out of the problem presented by the failing American crop will not only involve the development of new cotton fields, but also bring about a modified conception of essential requirements, so far as they relate to the personal and household use of cotton goods.

There can be little doubt that in the years of comparatively cheap cotton which preceded the Great War, its products were used extravagantly in some portions of the world, at least. The cost was so low that goods were cast aside before they were worn out, and the whole trend of events was in the direction of increased consumption per capita. In those days, students of cotton market conditions used to concern themselves with conjectures as to how much cotton would be required if all the world were to use goods as freely as the Western civilizations. But a trick of economy in the use of staples to permit of indulgence in luxuries, seems to have been one of the outgrowths of the War in relatively prosperous countries, while in others, people have learned under compulsion that they can get along with fewer goods than they used to think indispensible. At any rate, a glance backward over the past two or three years certainly creates a strong impression that prices for cotton goods based on raw material costs of above 20 cents in the American markets have had a tendency to restrict their movement into ultimate consumption. Of course when values are spoken of in terms of cents per pound, many indirect uncertainties are involved such as questions of relative values, and a price which may seem low in times of inflation, may prove dear in days of contracted credits and an increased buying power of money.

As these matters have stood, for the past two years, however, one can hardly doubt that, as a world-wide proposition, economies in the use of cotton goods have started at prices based on raw material costs of between 20 and 25c. and have become more pronounced on further advances. To the extent that this is true, the supply of goods in circulation, that is to say in the possession of the ultimate consumer and in the channels of distribution beyond the looms, must have been correspondingly reduced, and as we enter the year 1924 it appears reasonable to assume that there is a potential demand for every pound of cotton that can be grown and for every yard of goods that can be manufactured, providing the latter can be produced and sold at reasonable prices. Meanwhile, the world is on restricted rations, and notwithstanding the check obviously administered to consumption by the high prices of last autumn, it is probable that the present trade year will end with cotton in an unprecedentedly strong statistical position.

Small Supply at Start

It may be recalled that the opening of 1923 found the world with a comparatively small supply of cotton available. The demand from abroad had been slowed-down somewhat by the advances of late 1922, but there had been no indication of any check to domestic mill activity, and cotton continued to be absorbed at a rate which was out of proportion with supplies remaining in the South. As a result, early January reactions were followed by a renewal of the upward movement which continued until the market reached the 31c. level during March.

The check to demand previously noted with reference to export business, then extended to the domestic goods markets, and it became evident during the spring that there would be enough cotton to meet the restricted requirement. The situation in this respect developed coincidentally with hope of a materially increased crop. A report issued early in the spring by the Department of Agriculture indicated that farmers intended to increase their acreage by about 12%. This, it was pointed out, would mean the largest acreage under cotton ever planted, and a decline set in which continued during the spring and the greater part of the summer.

The new crop planting season was not altogether favorable. There was too much rain and the start was delayed in some sections but the report of the Department of Agriculture at the end of June sustained the earlier figures on acreage, and in a general way the hope of a substantially increased crop persisted up to nearly the end of July. At the end of June, the prospect, according to the Department of Agriculture was for a yield of 11,412,000 bales. On July 25, the indication was increased to 11,516,000 bales. But unfavorable weather conditions developed during August, and from that time onward, deterioration was rapid. By the end of August, crop estimates had been reduced to about 11,000,000 bales and in an extra report issued as of Oct. 25, the Department placed the outlook at only 10,248,000 bales.

The autumn was unfavorable in almost every respect with rainy weather, early killing frosts and freezing temperatures in some sections which not only cut short all late development, but caused great damage to grades. On the whole, it was hardly surprising that final estimates of the yield should show a further reduction, and private ideas of the crop were scaled down to about 9,500,000 bales before the end of November. This proved under the mark, as the Government's final estimate issued on Dec. 12, placed the yield at 10,081,000 bales of lint cotton and Census ginning returns since then have tended to confirm this figure.

Reaches 37-Cent Level

The advance which accompanied the scaling-down of crop estimates continued until prices reached the 37c. level at the end of November. At these figures, the speculative sentiment created by small crop figures, appeared to have been pretty well exhausted. A realizing movement developed in consequence, and March contracts which had sold at 37.11 at the high point declined to 32.90 before the Government's crop estimate was issued. This figure brought in more trade buying and there were rallies promoted by the unusual rapidity with which early season receipts were absorbed and the strength of the spot markets. Above the 35c. level, however, selling became a little more active and the market was unsettled at the opening of the new year with trade attention divided between the strong spot and statistical situations on the one hand and the evidences of domestic mill curtailment on the other. The old saying was recalled that the market could not be successfully bulled twice in the same season on the same factors, and a diminishing volume of business in the futures markets suggested a disposition to wait either for trade demand to lead in another advance, or for the development of new crop prospects to create a fresh speculative sentiment.

The remarkably rapid absorption of the early new crop movement was undoubtedly due to the large forward sales made during the spring and summer. One of the interesting features of the year from a statistical standpoint, was the fact that foreign mills consumed more than a million bales in excess of their importations of American cotton for the season ending July 31, 1923. According to the reports of the Census Bureau, exports for the season were only 4,864,027 bales, while preliminary reports by the Department of Commerce indicate that foreign mills consumed 6,127,000 bales of American cotton, linters included.

The indications are that while foreign spinners ceased buying in the American markets owing to the hope of a more plentiful supply from the crop of 1923, they continued to make goods, drawing upon stocks held abroad for that purpose, but replacing by purchases for early new crop shipment at the prevailing discounts. As a result, a very large trade short interest was accumulated which was forced to cover on the advancing markets of last autumn, and the generally unsuspected extent of this interest was largely responsible for the sharp advances of last November. Domestic mills also bought considerable cotton for early new crop delivery, and it is not unlikely that a very similar situation will develop toward the end of this season should a promising new crop start result in the appearance of big discounts on new crop months in the futures markets.

Boll Weevil Effect

The question as to whether the South can be counted upon for anything like a pre-war crop under prevailing boll weevil conditions, has naturally been emphasized by a third short yield in succession. Just how far the boll weevil has been responsible for the decline in the American crop is not clearly established. But that it has been a factor of the first importance can hardly be doubted, when one compares the average yields per acre for the last five years, with those for the five years 1910 to 1914, inclusive. These figures are given below, and it may be noted that the average yield per acre for the last five-year period shows a falling off of approximately 45 lbs. per acre as compared with the pre-war period.

Growth of	Planted acreage	Lint yield	Average yield per acre
1910	33,418,000	11,608,616	170.7
1911	36,681,000	16,692,701	207.7
1912	34,766,000	13,703,421	190.9
1913	37,458,000	14,156,486	182.0
1914	37,406,000	16,134,930	209.3
Five year average		14,259,231	192.1
1919	35,133,000	11,420,763	161.5
1920	37,043,000	13,459,603	178.4
1921	31,678,000	7,953,641	124.5
1922	34,616,000	9,762,069	141.3
1923	38,287,000	10,081,000	128.9
Five year average		10,531,415	146.9

It is certain that weather conditions could not have been entirely responsible for the falling off year in and year out, as shown in the above table, but it is likely that they accounted largely for the shortage of the present crop. Had it not been for the delays in planting during the spring, for drouth during the summer and for the unfavorable autumn, the story might have been different. Nevertheless, it seems that the South has not yet learned to master the

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boll weevil, and until it has actually demonstrated its ability to produce cotton on the old-time scale, the world must feel far from sure of its supplies and continue its efforts to develop new fields or to extend some of the older ones. Progress is being made in both directions, although this year's crops in both Egypt and India have been rather disappointing, and many obstacles remain to be overcome before the newer cotton-growing countries can be counted upon to materially supplement the American crop.

The Coming Crop

Preliminary conditions bearing upon the coming crop in this country are considered generally favorable. There have been rains which have put a good season into the ground in the Southwest and more recently cold weather over the belt is believed to have minimized the boll weevil carryover. It is generally anticipated that the acreage will be increased, and that prices have been high enough to stimulate effort generally. Increased effort means, no doubt, increased use of fertilizers and increased use of boll weevil poison, as well as additional expenditures of labor and care in cultivation.

New soil is being brought into cultivation in the Southwest where the boll weevil appears to be less destructive than in the eastern or central belts, and with a favorable start, Texas, which this year raised a good crop, may raise a very big crop next season. For the first time in the history of the cotton trade, so far as the writer can recall, North Carolina has raised the second largest crop of any State in the South this season, and as good prices have been secured for the cotton, there may be some further extension of cultivation in that quarter. On the whole, however, increased area must be looked for chiefly in the Southwest, and the hope of a materially increased crop would seem to depend largely upon the sections West of the Mississippi. Farmers in eastern belt sections have had too many discouragements to pin their faith on cotton, and there can be little doubt that diversified farming has secured a stronger hold, particularly in Georgia.

The spinning value of the present crop is believed to be under normal. There is increased waste in the manufacture of low grades and in addition to that the bales are running very light this season.

Statistical Position

Statistically the position at the beginning of 1924 is even stronger than it was at the beginning of 1923. There is more or less confusion as to just how much cotton was carried forward from previous crops at the beginning of the present season, that is to say on August 1, 1923. Secretary Hester, whose figures are generally regarded as reliable placed the world's carryover of American cotton on that date at 2,573,000 bales, including 177,000 bales of linters. The Department of Commerce in its preliminary statement placed the world's carryover at 3,100,000 bales compared with 5,123,000 the previous year, excluding linters. Including linters, the world's carryover of American cotton was probably 3,280,000 bales and on the basis of available data published by the Census Bureau, the carryover of lint, linters, and foreign cotton in this country was approximately 2,270,525 bales compared with 3,084,663 the previous year.

Based on these figures as to the carryover in this country, the statistical position as it existed on Jan. 1st, might be summarized as follows:

	1923-24	1922-23
On hand Aug. 1st	2,270,525	3,084,662
Lint crop	10,081,000	9,729,306
Linters	610,000	688,708
City crop and corrections	125,000	579,406
Imports	400,000	469,954
Indicated total available	13,486,525	14,472,036
Exports to Jan. 1st	3,323,951	2,906,052
Domestic consumption to Jan. 1st	2,754,146	2,953,890
Total to Jan. 1st	6,078,097	5,859,942
Leaving available Jan. 1st	7,408,428	8,612,094
Exports after Jan. 1st		1,957,975
Domestic consumption after Jan. 1st		4,348,594
Total after Jan. 1st		6,306,569
Burnt for season		35,000
		6,341,569
Total carryover in U. S.		2,270,525

After Jan. 1st last year domestic mill consumption, including linters and foreign cotton amounted to 4,348,594 bales and exports to 1,957,975 bales as shown in the above table.

Domestic Mill Consumption

Domestic mill cosumption for the first five months of this season has been running at a rate which would aggregate about 3,850,000 bales for the balance of the season, and of course it will be necessary to maintain stocks of cotton in the mill warehouses and in the leading markets of the country at the end of the season. If we allow 1,800,000 bales for these stocks compared with 2,270,000 last year and set aside 3,850,000 bales for domestic mills between the first of January and the end of July, we have left only 1,858,000 bales for export during the last seven months of the season. In other words, if stocks in this country of all kinds, are not drawn below 1,800,000 bales by the end of July there will have to be a further falling off in domestic mill consumption or a very severe drop in exports, during the balance of the season as compared with last year.

Comparative Figures

In connection with the above figures, it may be found of interest to compare the crops, exports, domestic mill consumption and season-end carryovers of cotton in this country for the last four years with those for the four-year period 1911 to 1915 inclusive as shown below:

	Crop	Exports	Domestic	Carryover
1911-12	16,068,936	10,681,758	5,367,583	*1,776,885
1912-13	14,159,078	8,800,966	5,786,330	*1,648,438
1913-14	14,290,320	8,914,839	5,884,733	*1,647,836
1914-15	16,738,241	8,644,563	6,009,207	4,324,890
Av'ge.	15,314,143	9,235,631	5,761,963	2,349,512
1919-20	11,920,625	6,598,347	6,762,207	4,572,812
1920-21	13,699,975	5,796,107	5,408,979	7,230,829
1921-22	8,360,153	6,316,121	6,648,853	3,084,663
1922-23	10,338,014	4,864,027	7,302,484	†2,271,529
Av'ge.	11,079,692	5,893,650	6,505,631	4,289,911

* Aug. 31st; later seasons July 31st.
† Estimated on basis Census figures.

It may be noted from the above table that the average exports per season for the last four years have shown a falling off of approximately 3,800,000 bales per year as compared with the pre-war average. The fact that domestic mill consumption has gained rather than lost as compared with the pre-war period, and held a more normal course, may be attributed to the relative prosperity and comparatively high buying power of this country. By the same token, however, domestic consumers are now probably better supplied with goods than foreign users, and it is possible that the records for the balance of this season may show a relatively greater curtailment of consumption in this country than in the takings for consumption abroad as compared with last year's figures for the same period.

RAW COTTON STATISTICS FOR 1923

	1923	1922	1921	1920
January:				
May contracts, New York	29.05-26.31	18.72-15.80	16.53-13.80	35.65-33.55
Domestic consumption, lint	610,375	526,552	366,463	591,921
Exports, lint and linters	473,436	475,910	605,381	929,671
Ginned to January 1	9,597,330	7,882,356	11,554,648	10,008,920
Ginned to January 16	9,648,261	7,912,452	12,014,742	10,307,120
February:				
May contracts, New York	30.29-27.22	18.46-16.15	14.59-11.25	35.32-31.50
Domestic consumption, lint	556,924	473,073	395,116	515,699
Exports, lint and linters	359,667	338,440	493,426	640,320
March:				
May contracts, New York	31.59-28.32	18.23-17.50	12.83-11.12	39.80-34.60
Domestic consumption, lint	623,105	518,450	438,218	575,789
Exports, lint and linters	318,210	461,484	375,180	794,460
Final ginning report	9,729,306	7,977,778	13,270,970	11,325,532
April:				
May contracts, New York	30.05-26.90	18.28-17.60	12.31-11.30	42.50-39.60
Domestic consumption, lint	577,396	446,843	409,247	566,914
Exports, lint and linters	259,984	612,659	319,933	546,125
May:				
May contracts, New York	28.85-24.90	21.65-18.26	12.98-12.02	42.98-38.80
Domestic consumption, lint	620,965	495,674	440,714	541,377
Exports, lint and linters	160,368	469,397	477,389	364,904
June:				
July contracts, New York	28.80-25.39	22.95-20.15	12.97-10.45	38.90-36.25
Domestic consumption, lint	542,166	507,869	461,917	555,155
Exports, lint and linters	214,851	491,079	495,474	241,449
"End-May" crop condition	71.0	69.6	66.0	62.4
July:				
July contracts, New York	27.25-22.50	23.25-20.92	12.52-11.30	43.75-38.00
Domestic consumption, lint	461,575	458,548	410,142	525,489
Exports, lint and linters	171,469	373,742	598,962	211,841
"End-June" condition	69.9	71.2	69.2	70.7
Acreage planted	38,287,000	34,852,000	31,678,000	37,043,000
Indicated crop new season	11,412,000	11,086,000	8,433,000	11,450,000
Commercial crop of old season	11,182,397	11,653,000	11,377,000	12,443,000
World's carry-over of American	3,100,000	5,123,000	9,364,000	6,216,000
Carry-over of Amer. in U. S.	1,904,219	2,955,000	7,039,000	4,448,000
August:				
October contracts, New York	25.35-21.07	23.00-20.00	16.63-12.69	32.65-25.68
Domestic consumption, lint	491,604	527,404	467,059	483,560
Exports, lints and linter	244,415	273,308	423,491	146,688
"End-July" condition	67.2	70.7	64.7	74.1
Indicated crop	11,516,000	11,449,000	8,203,000	12,519,000
September:				
October contracts, New York	30.30-24.86	22.56-22.00	21.50-15.97	29.60-23.45
Domestic consumption, lint	483,852	495,344	484,718	457,967
Exports, lint and linters	689,435	368,890	532,839	228,068
Ginned to September 1	1,141,327	806,218	485,787	251,589
Ginned to September 26	3,215,394	3,883,006	2,920,382	2,249,606
"End-August" condition	64.1	57.0	49.3	65.7
Indicated crop	10,788,000	10,575,000	7,037,000	12,783,000
October:				
December contracts, New York	31.05-27.12	24.55-20.50	21.95-17.93	22.90-17.80
Domestic consumption, lint	641,825	533,950	494,317	401,335
Exports, lint and linters	781,722	798,664	874,510	583,725
"End-September" condition	49.5	50.0	42.2	59.1
Indicated crop	11,015,000	10,135,000	6,537,000	12,123,000
Ginned to October 18	6,415,146	6,981,000	5,497,364	5,764,582
November:				
December contracts, New York	37.70-30.28	26.80-24.77	18.50-16.15	22.70-14.86
Domestic consumption, lint	531,631	577,561	526,610	332,712
Exports, lint and linters	770,002	858,337	648,695	683,323
Ginned to November 1	7,565,866	8,146,227	6,646,354	7,508,633
Ginned to November 14	8,374,148	8,875,840	7,274,201	8,914,642
December:				
December contracts, New York	37.15-33.20	26.20-24.05	19.06-16.80	16.45-13.85
Domestic consumption, lint	461,560	527,345	510,925	295,292
Exports, lint and linters	845,581	607,853	639,825	788,578
Ginned to December 1	9,554,179	9,323,307	7,639,961	10,141,293
Ginned to December 13	9,807,138	9,493,296	7,790,656	10,876,263
Government crop estimate	10,081,000	9,964,000	8,340,000	12,987,000

Demand for Staples Disappointing

Unresponsiveness to Advances in Cotton Contract Values an Important Factor

MEMPHIS, TENN.

UNRESPONSIVENESS to advances in cotton contract values, and consequent narrowing of premiums, compared with the contract grade, are among the outstanding features of the year in staple cotton markets. Demand for staples has been disappointing throughout the year, and at times approached stagnation. Staple values are higher than they were a year ago but not to the same extent that prices of other cottons have advanced. The closing week of the old year witnessed not only the highest prices, approximately, of the calendar year for the contract grade but also peak prices since the great collapse of 1920. The year-end average price of middling at the 10 official markets was 35.02c. This compares with the average price of middling ⅞ uplands at Memphis in previous years as follows: 25.12c. 1922-23, 18.12c. 1921-22, 15.15c. 1920-21, 39.26c. 1919-20, 28.97c. 1918-

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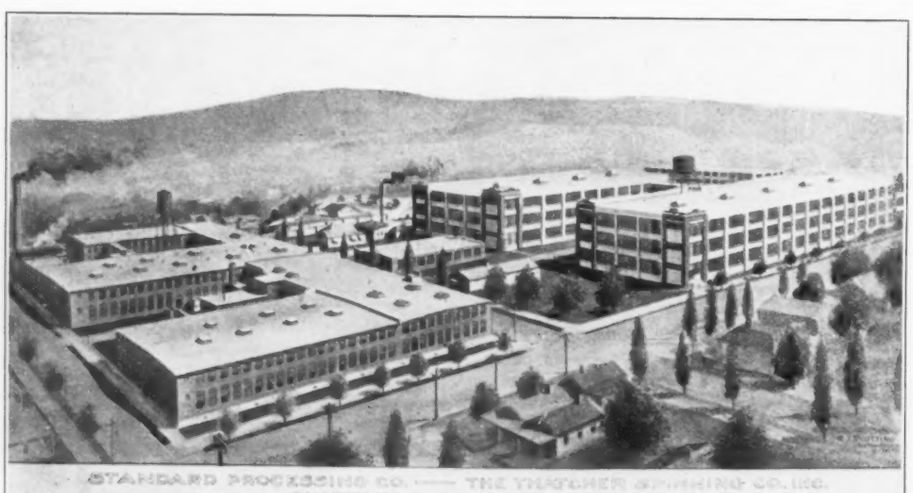

19. 30.63c. 1917-18 and 19.33c. 1916-17. In 1913-14 the average was 13.40c.

Widening differences which have increased the discounts on the lower grades, particularly grades below low middling reflect a low grade crop. Low grades of short uplands as well as staples are affected. In the previous year, owing to unusual demand for low grades, differences were narrowed in a way that few would have believed possible; there were times when shippers appeared to be indifferent as to grade, and willing to pay as much for one as for the other. This year the tendency has been to restore parities on a basis of what heretofore have been considered intrinsic values.

While the position of the grower and of the handler of staples is in sharp contrast with their own position a few years ago, and compared with short cotton now, both grower and handler are disposed to sit steady and to hope that staples will come into their own again; this notwithstanding three successive years of marked depression.

The disposition is to attribute relative weakness to reduced demand without corresponding curtailment in production. It is pointed out that there has been no such slump in production of fine cottons as there has been in other growths. Total production of American cotton in three years approximates 27,700,000 bales, without linters, compared with 36,502,982 bales in the three preceding years.

Perhaps substitution of short lint for staples 1⅛-in. or better, in the manufacture of tire fabrics, the condition of depression which prevailed for so long a time at Manchester, and American importations of Egyptians account in part for the distress of staples; nevertheless it is true that production of American staples was larger in the last three years than in the preceding three years despite a loss of about 9,000,000 bales in total production of cotton.

Position of Cooperatives

Some unfriendly interests charge responsibility for depression in staples to co-operative associations. This on the assumption that concentration of supplies relieves the spinner of the necessity of competitive buying, and at the same time enables the consumer to put his finger on supplies without having to arrange for them in advance. On the other hand some individuals have not hesitated to contend that buying interests have substituted for staples wherever possible with the purpose of destroying that co-operative selling organization which appears to have the best chance of success.

Despite the fact that the year has been very dull for staples, more than a few dealers were enabled to do a profitable business. Before the wide advance in contract values some merchants accepted forward business at several hundred points on deferred deliveries in New York; December was a favorite month. Since then premiums have narrowed or have been wiped out, and shippers have been able to buy cotton at prices not far from even with the delivery months to fill their contracts.

Some hedging and some purely speculative operations in the contract markets also proved highly profitable. Hedging was not always an advantage, however, and there were instances where, owing to disparities, hedging resulted in a double loss. In some cases hedging restricted selling of the actual, and offerings were restricted to unhedged cotton for which the price per lb. was satisfactory, while the owner of hedges was circumscribed by basis.

Prospects For 1924

Undeterred by past failures, tempted by high prices, and, in some instances driven by desperation due to pressing obligations, indications are that the cotton acreage this year will be nothing short of all that it is humanly possible to plant. It is believed that over-production is not among things even remotely possible. It is realized that high prices invite competition and the development of other regions for cotton growing. Of course it is understood that a more adequate supply would not command such prices as have prevailed for several months, but the best thought is that a crop of 15,000,000 bales selling at 15 to 20 cents a pound is preferable to 10,000,000 bales at 40 cents.

Intentions to plant a large acreage are being influenced by the belief that a favorable season is due on the law of averages. The last two winters, each of which was followed by unprecedented damage from boll weevils, were extremely mild. While most of this winter has been mild zero weather has occurred in Memphis territory; freezing temperatures extended to the coast, from one end of the belt to the other, a condition generally regarded as highly unfavorable to boll weevil survival.

Financial restrictions and labor scarcity may limit the acreage to some extent. However, crops have been planted under more difficult conditions financially than presently exist. Labor shortage is not likely to be felt until harvest time. There is little or no labor shortage west of the Mississippi river. In Mississippi in 1923, it has been estimated, the supply was 6% less than during the preceding year when approximately 1,000,000 bales were harvested by December 1. The exodus from Georgia and South Carolina has been very large and appears to be one of the direct results of pauperising yields of cotton. Southern banks are in much better position than they were two or three years ago. Their experience with boll weevil makes them cautious, of course, but a winter unfavorable to boll weevil survival will probably influence money lenders to the exercise of less caution. Banking restrictions will probably be reflected more in personal economies than in the acreage planted to cotton.

The unsatisfactory position of staples has created a sentiment against the staple crop as a profitable investment. It costs several cents more the pound to grow staples than it does the shorter cottons. Most of those who have been growing staples for several years will continue to do so, but those with briefer experience are drifting back to the short cottons, some to the muchly condemned half-and-half varieties.

Cotton Wastes Have Good Year

Demand Generally Larger Than Supply — Large Imports — Highest Prices for Two Years at Close

COTTON waste during the years 1922-23 experienced a rising market, the advance being marked by spot cotton moving from an average price of 18.30c. in January, 1922, to an average of 36c. for December, 1923. Wastes followed cotton closely, combers selling at 14.5c. in January, 1922, and 31.5c. in December, 1923.

The forecast for 1924 is dominated fundamentally by the consideration as to whether cotton and its wastes can have a third successive year of upward movement Contracts for 1924 have, however, been made at high prices, around 85% for combers and 80% for strips. But in view of a possible, if not probable, shortage of cotton these high-grade spinnable materials will probably meet with good demand and 90% or better for peeler comber is considered quite likely.

The general course of the waste market during the year is shown by the following comparisons of choice cotton wastes, average prices for the month, showing opening, early high, low, and close for 1923, also average spot at these periods.

Date	Spot	Comber	Strips	Cop	Picker	
Jan.....	27.28	25.5	23.5	13.	8.5	Opening
Mar.....	30.50	26.5	25.5	13.6	10.0	Early high
Aug.....	24.67	22.	21.	11.	6.	Low
Dec.....	36.00	31.5	30.5	15.	13.	Close

Importing of large quantities of cotton waste was one of the chief features in cotton waste for the year 1923. For the first nine months of 1922 imports totalled 7,203,000 pounds while for the first nine months of 1923 the immense total of 70,045,000 pounds was brought in to replenish the relatively small supplies held in this country by reason of successive short crops of cotton and relatively good demand for materials for upholstery and stuffing purposes. These importations were not altogether a success inasmuch as a quantity of the material was bought at relatively high prices abroad and on its arrival in this country, in the early part of the year, met with a declining market and in addition a quite unexpected imposition of 5% ad valorem duty, still unrepealed.

While imports of cotton waste from January to September showed a tremendous advance over the preceding year, on the other hand, exports of American-made wastes, chiefly combers, showed a decrease of 24.4%, falling from 49,303,000 lbs. in 1922 to 37,309,000 lbs. in 1923.

Lower Mill Contracts

Mill contracts for the second half of the year were made at approximately 10% lower than the first half of 1923. There seemed to be a tendency in the market toward reducing the high percentage basis upon which combers and strips were being marketed. Bearish traders were not quite so confident. The outlook was for a much shorter crop than had been generally anticipated. Choice combers and strips were holding firm and had now advanced to an 82-85% basis. Not much comber was coming onto the market as New Bedford production had been cut considerably.

Sak. Strips Disappear

A feature of the market so far as particular stocks were concerned was the surprising strength in Sak. and Arizona strips, good grades of the latter being quoted as high as 26c. Peeler strips were also scarce and high-priced. Sak. strips had disappeared almost entirely. They had not been abundant and as they were long-fibered and the color was no objection if they could be used in yarns likely to be dyed they had passed out of the market on a high price level of 80% or better of spot cotton. Cotton mills were not getting much business and were still showing a tendency toward curtailment confronted as they were by uncertainty regarding the liklihood or otherwise of marketing their finished products based upon high cotton costs. But so far as wastes were concerned it was generally admitted that curtailment in cotton manufacturing proper would bring about a scarcity and that from this standpoint the market situation seemed promising. Traders continued to complain of shortage of available materials and could see nothing ahead but further curtailment in supplies of the better grades of spinnable materials coming out of the New England mills.

Nervous December Market

The market in December was somewhat nervous, not altogether well pleased with such high-priced cotton and somewhat perturbed over the hazard and difficulty of arranging for its contracts to cover waste production for the year 1924. It was almost impossible to sell choice combers on an 80% basis with spot cotton traveling between 36½ and 37½c. Some contracts were made at the beginning of the year on an 87½% basis which would mean that cotton billed in at this time would cost approximately 34c. The selling price of choice comber ranged from 80 to 83% and for choice peeler strips from 78 to 81%.

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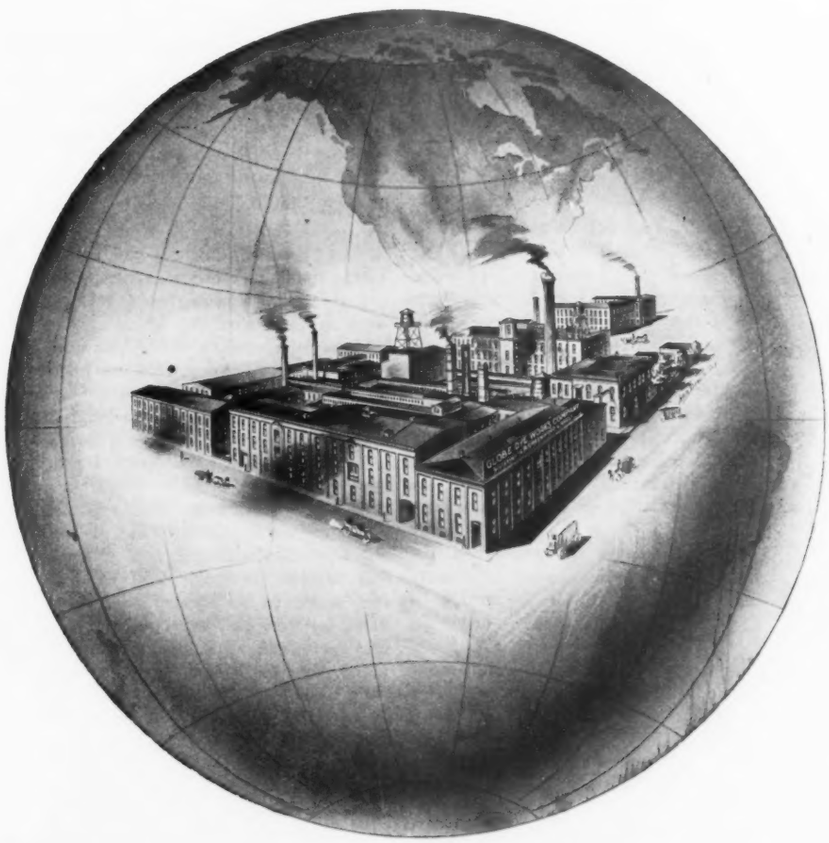

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Theory and Science in Mercerizing

(*Continued from page 218.*)

ponding mercerized yarns, the strengths were higher at the start in the softer twists, but decreased in the harder two-ply twists.

The variations in tension were measured by noting the stretch of the skeins on the mercerizing machine. At 7% increase in circumference there was usually yarn breakage; 4% was the highest used for various 6 o/2 yarns.

Fibre and Yarn Strength

The cause of an increase in strength must be either an actual increase in the strength of the cotton fibres or a change in some of the other factors of yarn strength. The first may be dismissed because several investigators have reported a slight loss of strength in mercerizing single fibres instead of a gain. In fact it is not natural to look to the fibres for an increase in the strength of mercerized goods because it has been established that the fibre strength has relatively little to do with that of the yarn made from it, roughly only a quarter of its strength being used.

The cause is apparently to be found in the increase in clinging power between the fibres in the yarn. This may be partly due to removal of the cotton wax, a lubricant, by the caustic, but probably results to a larger degree from the increase in diameter of the separate fibers simultaneously with a decrease in the diameter of the yarn. The natural result is a harder yarn with more "friction" and more strength.

As is well known, the extensibility is reduced by mercerization. This seems to be a logical consequence of the process and does not require any involved explanation. Yarn mercerized without tension shrinks, but will then stretch more than the original yarn. Yarn mercerized at original length in certain tests on 60s-2 had the same extensibilities as the gray; 5.45 and 6.45. At 7% "strength" they showed after mercerization 3.85 and 4.4. The tendency is to reduce the extensibility during mercerizing, so there is less in the finished yarn, and often to put in enough permanent stretch to raise the count.

A Physical or Chemical Change

One of the most interesting and puzzling questions has been whether mercerization is a physical (that is, a mechanical) or a chemical process. The addition in a chemical sense, of some of the caustic to the cotton would be the most obvious explanation, and formulas have been assigned to such compounds. On washing, the caustic is supposed to be replaced by an equivalent amount of chemically combined water, forming a cellulose hydrate. This would change the analysis of the cotton. As a matter of fact, however, the analysis is the same before and after mercerizing.

Another type of reaction has been suggested where the soda compound would revert to the original cellulose on washing, but there is no positive proof that it has ever existed.

It has also been found that strong mineral acids, which are chemically different from caustic, cause almost the same effects as mercerizing, i. e., swelling, greater attraction for hygroscopic moisture, etc. This points toward a physical effect.

It is only fair to say that there is still a difference of opinion on this subject, although the more recent researches are tending away from the chemical idea, and regarding the increased affinity for dyes and moisture, and the increased susceptibility to certain chemical reagents, as due to the physical changes of swelling and increased surface.

Possible Test for Degree of Lustre

Many attempts have been made to determine the degree of mercerization and a simple test that would express this quantity in figures would be very valuable. It could be applied as a part of the routine control work to help maintain a uniform output and would often serve in cases of doubt or dispute as to quality. For scientific purposes the amount of caustic solution absorbed or the amount of swelling of the fibre have been employed; in practical work we rely on personal judgment of the lustre; while a convenient laboratory test of some value is the action of dyes, for example, benzo-purpurine.

A recent development (Adderley and Oxley) has led to successful methods of judging lustre. Although not yet adaptable to every day use, they have furnished information of practical interest in relation to the twist in two-ply yarns.

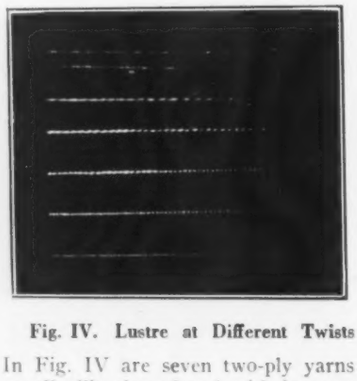

Fig. IV. Lustre at Different Twists

In Fig. IV are seven two-ply yarns equally illuminated and with increasing doubling twist. It is evident that the middle one with a moderate twist is brighter than the softer twists above or the harder twists below. Judging the brightness by the eye alone, however, might not be much better than inspection of the original yarn, so the photographic process has been so designed that the more lustrous the sample, the further its reproduction will extend to the left. The illustration of 3s-2 yarn shows this effect very clearly. Another apparatus was designed to measure the lustre and express it in figures. This is not yet a commercial development although such a device would often be of great value.

In conclusion, many of the ideas that we have outlined represent only preliminary work or results that have not yet been checked sufficiently to assure their general applicability. However, the recent publications from which most of them are taken, largely the *Journal of the Textile Institute*, give the best possible cross section of the present status of the theory of the subject. It is a long, long way from the mercerization of warps or piece goods in machines a hundred feet or more long, down to laboratory tests on single fibres a twelve hundredth of an inch in diameter and an inch in length. The latter type of work is often called theoretical and dismissed as useless. There are, however, good and bad theories. Such as we have outlined are attempts at detailed explanations of the things that happen every day and are all based on definite evidence. Perfect understanding of the technical operations can come only through the study of painstaking experimental work, or, in other words, research.

Early Mercerizing Problems

Reminiscences of Interesting Problems Solved and Some That Still Remain Unsolved

By *William D. Hartshorne**

THE editor of the TEXTILE WORLD has asked me to give an account of my recollections concerning the early history of mercerizing in this country. In doing so the reader must bear in mind that this is an account of my recollections. The documentary evidence is somewhat confusing as to dates, facts, and theories.

It is well known that the Englishman, John Mercer, took out a British patent as far back as 1850 for a process of treating fabrics with solutions of caustic soda, caustic potash, sulphuric acid, and chloride of zinc, subsequently washing out or neutralizing the chemicals used. The effect produced by Mercer was recognized by him only as a novel means for increasing the strength of the fabric, and he does not seem to have been aware of the effects produced by preventing the shrinkage. Some of his followers did note, in some cases, a silk-like result. However, it remained for Horace Arthur Lowe, an English chemist, in March, 1890, to show in his patent of that date that it was the prevention of shrinking in dimensions, whether it were a piece of cotton fabric or a skein of cotton yarn, which brought out the wonderful luster effect. Even Lowe's success must have been insufficiently recognized in the trade, as it did not give him the encouragement needed to take out patents in other countries. Indeed it is questionable whether the benefit from the luster point of view on the cheaper grade of fabrics would have been sufficient to attract such attention. It was not until the enlarged use and better understanding of the long fibre cottons, like Sea Island and Egyptian, came into vogue that the full merits of the invention became properly understood.

Basic Patents Made Free to Use

In the meantime, Richard Thomas and Emanuel Prevost, proprietors of a dye works in Crefeld, Germany, secured a German patent for an alleged improvement on John Mercer's original process, by keeping the yarn, or cloth, under tension until it had been washed. Fortunately, for the rest of the world, their application for such a patent in Great Britain was contested by Lowe, and was declared defeated, or at least it was limited to the effect of other reagents than the caustic alkali group. It will be remembered that Mercer had claimed sulphuric acid and chloride of zinc as producing the shrinkage effects, and Thomas and Prevost included these also in their claims, while Lowe had confined his application to caustic soda or caustic potash solutions. This limitation, of course, rendered the British application of no value, and it was abandoned by Thomas and Prevost.

On June 9th, 1898, the German Patent Office declared Thomas and Prevost's patent, which had been allowed March 4, 1896, as void, it having been discovered by them that the invention had been anticipated by Lowe's patent of March 21, 1890.

In the meantime, these enterprising Germans had secured patents as of date March 15, 1898, in the United States. The priority of Lowe's invention was overlooked by our patent officials since Lowe had made no application for such a patent in this country, but the protracted litigation that followed in this country resulted in the defeat of the American Mercerizing Co., the owner of the Thomas and Prevost rights in the United States.

Mercerizing at Arlington Mills

Meeting the competition of attractive imported fabrics in which mercerized yarns were used, the Arlington Mills began experimenting in the production of mercerized yarns in 1897. In these their success was so great that they immediately began improving their facilities by adapting their existing machinery to the conditions required.

I recall very well that an ordinary

* Former Agent Arlington Mills, Lawrence, Mass., and Former President National Association of Cotton Manufacturers.

two or three-box cotton-warp dyeing machine was used at first without any alteration. These boxes were made of wood, on which the caustic soon produced so destructive an effect that they resorted to lead lining to preserve the one used for the process. It was soon found, however, that this small machine was insufficient for their demands, and a longer one, with a boiling-out box at the beginning, and cast iron boxes for the two stages of caustic baths required, but still retaining the wooden boxes in addition for the washing and souring off.

It was soon found, however, that there was much danger involved by depending on a washing bath to remove all traces of acid. The effect of acids left in is well known to produce tender yarn. To avoid this danger, a neutralizing bath supplied with just enough ammonia to show an alkali reaction at the delivery end of the wash box fairly well completed the cycle required.

Unevenness Due to Dyeing

There still remained the problem of proper drying. It was noticed that under certain circumstances, such as too high a temperature in the final cylinders of the dry cans, left the warps in such a condition that when subsequently dyed there was evidence of unevenness in shade.

Much investigation was carried on to prove the cause of this effect and to avoid its manifestation. Among other things it was found that warps dried in festoons and not dried on cans, unless unevenly mercerized or unevenly neutralized, showed no such effect when dyed. The full meaning of this difference did not appear until much further experimenting and theoretical consideration had been given the supposed chemical composition of fully mercerized and only partly mercerized yarn. In such yarns a marked difference of shade was always apparent. The difference in color affinity between mercerized and unmercerized yarn was of course well known, and the fact that the oxycellulose stage, which sometimes showed up in both bleached and mercerized yarn under special kinds of exposure to oxidizing conditions, required the elimination of this kind of change from the problem.

Among other important sources of irregularity in mercerizing results was found to be lack of uniform conditions as to temperature in all stages of the process, which involved cooling methods of some kind. Much claim was at one time made for refrigerating processes to keep the temperature as low as possible in the caustic baths, as a less amount of caustic, or a weaker solution of caustic could be used to produce the mercerizing effect at such reduced temperatures. No economical benefit was found from such refrigerating efforts beyond the necessity for keeping the temperature down to some easily controlled point, say, 68 to 70 degrees Fahrenheit. Less irregularity seemed to be shown under such normal-like conditions.

An Unsolved Problem

The provoking dry can irregularity still showed up when the method of dry-can drying was used. But quantity production demanded such a method. A further study, however, finally showed that the gray yarn (that is, unmercerized yarn) was itself liable to show this irregularity with some kinds of dyestuff when the warps had been dried by the dry-can method before being dyed. This condition would only occur, however, when failing to complete a day's run on schedule time. Thus the dry can difficulty was traced to a common cause of high temperature contact, whether the yarn was mercerized or not. The outer layers in the warp strands being more exposed to the heat than those in the interior occasioned many efforts at compromise conditions and still left this as one involved in the question of cost. The precise reason for this temperature effect does not seem yet to be fully understood.

Long-Stapled Cottons the Best

There is no doubt that any kind of cotton yarn is susceptible to showing some degree of the mercerized luster effect, but it continued to be recognized that the long stapled cottons of the Sea Island and Egyptian type gave the most perfect results. No doubt this was partly due to the fact that a good yarn could be made from such long stapled material with less actual twist in the spinning, and the subsequent two-ply would thus require a less proportional twist. In other words, the fibres would be left in a more nearly parallel condition and give a more glass-rod-like appearance.

Another important improvement consisted in the gassing of yarns which were to be mercerized. The gassing process, by removing the fuzzy ends, tends also to improve the luster-producing conditions.

The Machinery Utilized

My personal experience was more closely identified with warp and skein mercerizing than with cloth mercerizing, but the practical conditions for good work were identically the same, and involved particularly the prevention of shrinkage and the complete neutralization or elimination of all the chemicals used.

Some of the best effects were produced on skein yarn by a mechanical contrivance of two sets of arms which could be spread apart by a screw thread attachment and again released to allow the skein to be changed in position by the rubber gloved hand of the operator. A similar machine had been previously used for skein dyeing. Where relatively small quantities of yarn of a kind are needed, the skein mercerizing process still remains the best and the most advantageous.

One such skein mercerizing machine whose principle of action was the use of a knuckle-joint holder, upon which the skeins of yarn were placed while the knuckle joint was open, but which was automatically locked taut by the pressing down of its center upon an intaking chain carriage, had some marked advantages. The continuous character of the chain carriage for the knuckle-joint holders enabled the latter to be carried from one chamber to another through the successive baths required by the process. This machine was particularly useful where heavy counts of yarn were desired to be mercerized.

Other skein mercerizing machines of various types superceded this rather cumbersome apparatus. In some of these the observer was able to study carefully what took place in the successive stages of the conventional processes. It was plain, for instance, that the action of the caustic soda, so long as the yarn remained in it, was to render the skein very plastic and extensible; that is, the force required to stretch it, or prevent shrinkage, was not needed till after the passage through the caustic bath.

Limitations and Possibilities

Involving these principles, an endless variety of commercially available effects were manifestly possible, from a semi-transparent, parchment-like result to the most beautiful silky, lustrous, strong, articles of commerce.

It should be noted that while the advantages of mercerizing are wonderfully great in direction of strength, yet where the element of elasticity is essential, a disappointing result is often observed. Attempts to use it for making sail cloth are a case in point. The whipping effect of the winds snaps the fabric just when its extra strength to win a race was needed most.

It has been noted, however, that in some kinds of knitted fabrics, as for instance hosiery, the character of the stitch imports sufficient elasticity to the otherwise rigid thread to make possible the production of articles having adequate wearing qualities and luster. Here again comes in the use of the mercerizing process on single yarns, which in themselves do not show much luster, but which can be used for reinforcing hosiery and add materially to its wearing properties, and at the same time ensuring uniformity of shade when the goods are dyed, the color affinity of the mercerized single being comparable to the color affinity of the two-ply.

The modern development of yarns made from cellulose acetate (artificial silk), whose brilliancy is even greater than that of silk, and when properly manufactured are capable of standing ordinary washing in the finished fabric, makes some people think that the high-tide of mercerizing markets has been nearly, if not fully, reached. A proper interpretation and successful application of the mercerizing principle, however, is still open to the expert designer.

Mercerization of Part Wool Fabrics

This subject should not be left without some reference to the remarkable effect of caustic soda within narrow limits of high strength of the solution and low temperature conditions on fabrics made in part from wool. Where the warp is made of cotton, a raised figure in worsted can be made and rendered brilliantly effective by passing such a fabric through a cloth mercerizing machine where neutralization can be made immediately effective as the cloth comes from the nip of the squeeze rolls.

Beautiful embroidery effects can be thus produced; or, by weaving a twist of cotton and worsted, either in the warp alone, the filling alone, or in both warp and filling, mercerizing the combination and subsequently carbonizing out the cotton, some beautifully light and wonderfully lustrous fabrics have been made.

Haynes Mills Finishing Plant

Addition to Plant at Avondale, N. C., Represents Completion of Original Plan

THE erection of a new finishing plant at the Haynes Mills, Avondale, N. C., a branch of the Cliffside (N. C.) Mills, represents the completion of the plan as originally conceived when this plant was erected about four years ago. The finishing department has been located in the main mill but this did not provide sufficient room for handling the chambrays, the product of the 560 looms at Avondale.

The new structure is of brick with concrete trim, daylight construction, monitor roof with pitch of ¾ of an inch to a foot, one story and basement. The finishing room is 50x137 ft. and will contain two tenters made by the Textile Finishing Machinery Co., one a 60 ft. frame and the other 90 ft.; two calenders; two Curtis & Marble brushing machines.

The make-up and packing room is 80 x 84 ft. and will be equipped with three Curtis & Marble folders and two Curtis & Marble board winding machines; also one or two Economy baling presses. The basement will be used for storage. Grinnell sprinkler system is employed throughout.

Opening Room

Another addition to this plant has been a new opening room in a separate brick building, one-story, 40 x 48 ft., containing a Saco-Lowell vertical opener. The opening room is in operation now and the installation of machinery in the finishing plant is nearly completed.

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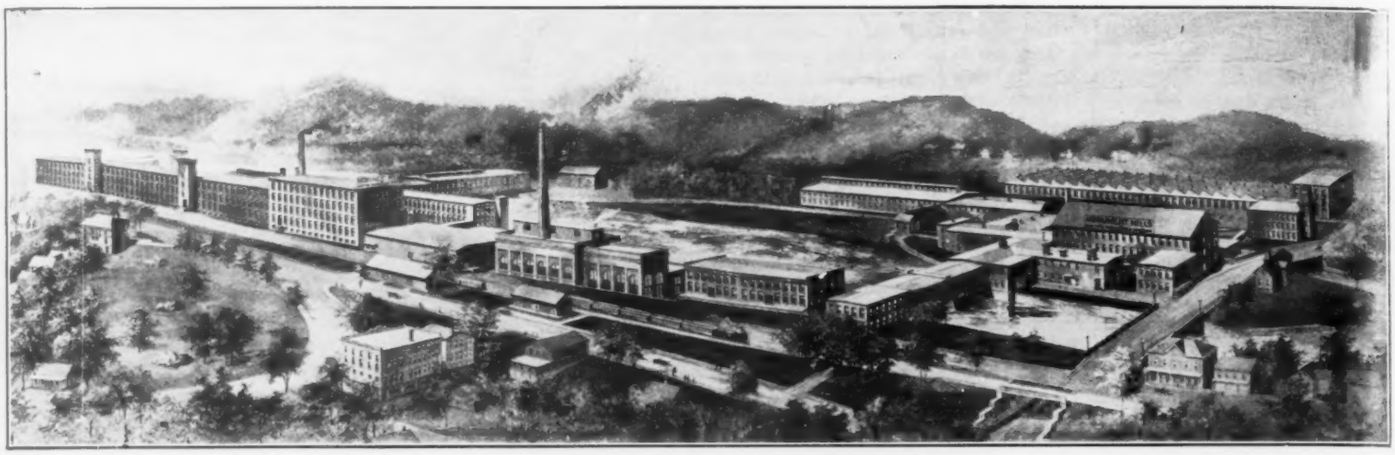

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Overproduction Checked Progress in Men's Wear

Year of 1923 Started With Enthusiasm in Woolens and Worsteds and Ended With Uncertainty—Climax in Great Overcoating Business—In Suitings Quality Gives Way to Price—Tropicals Were Active—Automobile's Influence Discussed—Price Advances Met Resistance

THE men's wear market followed the proverbial entrance and exit by starting the year 1923 with the vigor and activity of a lion and by ending it with the weakness and uncertainty of the lamb. Over-anticipation of good business on the part of buyers and over-production on the part of mills during the first three or four months of the year put the primary market in a position to suffer most acutely from the setback in the retail field which became evident when the consumer failed to do what was expected of him in May and June. The history of the remainder of the year was a contest between an inherently strong raw material market and a weakened field for the manufactured products. Buyers were unwilling to cover ahead, and forced liquidation from various accumulations set a falsely low value upon goods.

The new year has started without much enthusiasm, though fundamental conditions are a better foundation for progress than they were during the last part of 1923. It is not believed that the mill man will soon again make the mistake of over-production and the slogan now seems to be "Operate at a profit or shut down." It is realized that 10 or 15c. a yd. may be the difference between prosperity and bankruptcy for a manufacturer, while it should mean the gain or loss of an appreciable amount of business in suits and coats. Price cutting competition has proved harmful, not only to the individual by destroying his profit, but to the industry as a whole by breaking the confidence of buyers.

Wanted—A Style Leader

The need of the new season in prospect appears to be a style leader. At present writing no such leadership is in evidence. Buyers have been groping through the general range of fabrics without a definite application upon any one line. Unless there is some change the consumer will find the spring showings to be very much what he saw last season and the strong buying incentive which a new thing instils will be absent. It is a matter of history that the tweed vogue induced many men to buy such suits who had never regarded tweed as suitable for everyday wear. It is well worth the attention of the industry's best minds to promote the popularity of some class of goods which will strike the consumer as new and induce him to buy a garment made from them at a time when he might otherwise consider his wardrobe complete.

The first part of 1923 will always be remembered as the climax of the greatest overcoating season the industry has ever seen. Distribution of coats at retail during the winter of 1922-23 was as complete as could be imagined. Practically every yard of fabric in clothiers' hands was made up and delivered, and practically every coat on retailers' racks was sold. Merchants hoped for a repetition of that sort of business in the winter of 1923-24. Even those who took the conservative view that there might be a slight reaction at retail, felt that business with mills would be unquestionably great inasmuch as the great reservoirs of stocks which normally lie between the loom and the consumer had been drained empty and would have to be refilled.

Speculation in Coatings

Knowledge on the part of clothiers that mills were preparing to cut down the orders tendered to them for the fall, 1923, season, multiplied the number of pieces asked for proportionately, and as a result demand went forward on a false and unnatural basis. At the same time there was a somewhat similar speculation in raw wool. Manufacturers bought considerable quantities abroad and dealers, enthusiastic over the manufacturing outlook, likewise outdid themselves in obtaining supplies from the foreign field. When it became evident that all sides of the market had greatly overestimated the power of the consumer to absorb goods, the wonder was that the market did not suffer more keenly than it did. There was a certain amount of cancellation during the later spring and mills for their own protection began to modify their deliveries in proportion to the credit standing of their customers. Boston became for a time the cheapest raw wool market in the world, and the phenomenom of wool exports from this country to Europe developed early in the fall. This transference of surplus raw material stock, added to a careful liquidation of goods, has pulled the market out of a difficult situation and leaves it on a fairly substantial foundation for 1924.

The advent of light colored fabrics in the winter coating field, which started in 1922, continued through last year and now gives promise of importance next fall. It is significant, however, that the most carefully dressed men have been turning from these light shades to dark and sombre colors, which gives a hint of what may be in store for the market as a whole in the future. The fancyback overcoating retained its leadership through 1923 and gives promise of holding this position through next fall. The soft spongy fabrics, however, in which these double-faced cloths have been produced, have been falling behind, and the best selling fancyback is one with a closely woven and durable surface. Stylers are watching the improvement of staples of the melton class and the steady gains of coatings of the through-and-through order. Both will benefit if the conservative trend mentioned above gets a hold on the popular field.

Suitings Started Briskly

The history of suitings through 1923 presents a movement in rather close sympathy with the overcoating trend. The year started with much popularity for the pencil-stripe worsted. Woolen suitings were best in the good qualities, and the cheaper sorts sold only on the fact that they could be put into suits to sell in the lowest price ranges. After the reversal of form during the spring, the fancy worsted became harder to sell and clothiers showed more interest in the cheaper lines of goods, especially woolens.

At the start of the year many of the smaller clothiers were buying better quality merchandise than they usually considered. This was due to the fact that a number of retailers believed they were losing business by tying up with a large manufacturing clothier who produced a nationally advertised brand. These retailers felt that they could not control quality of fabric as much as they would like, and that they were offering their customers greater value in cut, make and trim than they were in fabric. They felt that they were losing business to other retailers who gave the highest possible fabric value with only reasonably good tailoring. Retailers began to believe that they could get repeat business from their customers on fabric value more than on any other one item.

Small Clothier Tried New Policy

The smaller clothier saw in this situation an opportunity to cater to portions of the retail trade never before successfully approached. They found retailers receptive on the basis that they could better control fabric quality by buying from the smaller clothier and that they could build up a more regular business for themselves by popularizing their own brands. Mill agents welcomed this trend toward the buying of better grade fabrics, but found it short-lived in most instances. The pressure for lower prices seemed to make the retailer forget his ideas on fabric quality and during the last six months of the year the bargain seekers seemed to outnumber those who were still trying to carry forward their business on a quality basis.

At the beginning of the year clothiers were found willing to buy goods of one-half to one ounce heavier than had been their rule, on the basis that they not only made a better garment but also achieved economy by the heavier goods having a lighter shrinkage. During the early part of the year there was more demand than usual for 16-oz. serges, but this along with the trend toward quality goods mentioned above, fell into the discard when competition became keener and the old monster of making garments down to a price came upon the scene.

Spring Opening Unsettled

Although the unsettled condition was pretty well known during June, plans went ahead for the spring opening and the season was started shortly after the middle of July. The attendance of clothiers was fair but their attitude toward buying most indifferent. Many believed that the showing was premature, but the events of following months showed that little would have been gained by delay. The early start, however, followed as it was by a weak raw material market in August, brought about price cutting among mill agents which checked any buying interest that may have existed. It became an open secret among buyers that publicly announced prices in some quarters were merely nominal and that the tender of an actual order was the start of negotiations which would end in materially reduced quotations. This unsettled confidence, and buyers withheld the business they might otherwise have placed. Even the firmer wool market in September failed to do more than bring a small scattered current of new business.

Tropicals Sell Well

The only lines which moved at all freely after the middle of the year for forward deliveries were tropical worsteds and other specialty cloths for summer use. Garments from such goods have been increasingly popular and the much talked about "third season" seems to have become an actuality. Many of the fabrics for summer wear are inexpensive and the popular price of the garment makes up for its lack of durability in the consumer's mind. What were formerly the spring weights of regular suiting lines have become year round sellers in many parts of the country. The fall and spring seasons in suitings have to a certain extent merged into a nine months business, with the tropical fabrics taking the lead for the remaining three months. Goods of this specialty class were opened last June and July at slight advances and the garments made from them have al-

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ready been well bought by retailers for next summer's distribution.

During 1923 there was much discussion as to the influence of the automobile upon men's dress. The buying of cars on the installment plan consumed a large part of the individual's earnings which might otherwise have been put into clothing, although one optimist has argued that when a man finishes his installments he finds himself with an actual monthly surplus equivalent to what he had been paying which he can then put into other things. The use of automobiles for recreation has doubtless changed the character of many men's attire leading them toward fancy mixtures and away from such staples as serges which so easily show dust and spots. The fact that automobiles are now in such general use, however, cannot mean a reduction in the number of units of garments consumed, for the wear and tear is actually greater than in the days when men sat at home or traveled entirely by carriage or train. Together with radio sets, automobiles have, however, absorbed a certain amount of ready money which might otherwise have gone into clothing.

Rise of Fancies in Women's Wear

Staples Lose Prestige as Sport Trend Gains—Prices Have Risen Against Resistance

THE history of the twelve months of 1923 in woolens and worsteds for women's wear demonstrates clearly the wide variety of events and trends which may be found within the confines of a calendar year. With this period of ups and downs behind the market, it is difficult for the observer to establish a firm footing from which to take his reckonings for the future. The factors which appear to be the best substantiated are as follows: A firm raw wool situation, fabric mills moderately sold ahead for spring, the sport element invading every-day dress, the readiness of idle men's wear looms to turn to dress fabrics whenever opportunity offers, encouragement for large production of cheap goods and piteous cries from the field of garment manufacture that no profits were made in the year 1923 and 1924's early tendencies give scant hope for change.

Changes That Lie Ahead

The elements here enumerated are difficult to coordinate and buyers and sellers alike are much in the dark as to what 1924 holds for them. The extension of the sport motif into every day dress brings pattern and color into parts of the field which formerly insisted upon such staples as twills, serges and poplins. The advent of this move toward fancies is going to help distribution to just the extent that style leaves price in the background when sales are made to the consumer. The rapidity with which good fashion in high class fabrics is copied in cheap goods is an element to be watched and a number of lines have gone on the rocks in past seasons because they were considered a good thing by too many manufacturers at the same time. The use of originality helps not only the mill management which has it, but the field as a whole, in that it prevents a concentration of production along a few limited lines.

The fact that many styles for the coming spring are new is counted upon to aid the volume of distribution. Women all over the country will want to add at least one plaid flannel dress to their wardrobe, and this same longing will apply equally well to the new things in coats and suits. As some merchants see the problem all the factors for a prosperous season are present, except the proper cooperation between parts of the garment and fabric trades themselves. Prompter and more farsighted buying by retailers would help, and the absence of the many small houses which are constantly selling garments on a bankruptcy basis would make for smoother distribution and for greater profits for the wholesaler. The absence of garment stocks would also help, for when the retailer knows that there is a stock of garments upon which he may draw at any time one of the inducements which are advanced for his buying ahead, is lost. Similarly the garment manufacturer is more apprehensive of an overproduction of fabrics or its equivalent, than of any other one thing.

High-Water Mark for Bolivias

In the coating field the year 1923 witnessed the high-water mark in the career of pile-sheen fabrics of the bolivia order. During the first six months there was heavy and continuous buying interest centered upon them, despite the fact that a number of novelties with brocaded or otherwise decorated surfaces were advanced in a number of quarters. The ready saleability of pile-sheen goods roused great enthusiasm among manufacturers, and mills which had never before made a similar fabric jumped headlong into its production. The result was a flood of inferior merchandise, which eventually had its effect upon the market. During the last three months of the year the striped and plaid woolen coating which was an outgrowth of the polo coat fabric, took the lead. The feeling persists that the better grade pile-sheen fabric has become a virtual staple, and by reason of that fact has many successful though more limited seasons ahead of it. The pile-sheen fabric has not been displaced by anything of a superior nature for the more formal type of coat. It has, however, lost its position in the more popular lines because it was overdone and because the rise of the sports idea developed a patterned fabric which caught the popular fancy at the moment.

There are two means whereby some manufacturers are keeping a certain amount of their pile-sheen production in the popular class. These are the inclusion of self-striped or figured two-toned effects, and the finishing of the regular bolivia in a full line of the new sport colors. The fact that today more women than ever before are regarding their dress from the practical as well as the artistic standpoint, gives the manufacturer of pile-sheen goods the hope that demand will return to his product after the consumer experiences the unsatisfactory wearing qualities of the cheaper woolens.

Last spring the camel's hair coating and its imitations made marked gains, and this spring it is apparent that velours, flannels, etc., will have their fling. Last summer much use was made of black and white in various combinations and the prospect now is that the coming summer will be more colorful, although white will still take an important part in the combinations used.

Ribs Versus Twills

In the field of dress fabrics, 1923 began with strong support to the newer staples such as poiret twills, poplins, reps, etc. Chain stitch embroidery which because a popular form of ornament, was widely used on these goods as a base. Manufacturers selling fabrics for this use found buyers more ready than usual to take off-colors and shaded pieces since these defects were obscured by the embroidery. As the year progressed a number of stylers viewed with enthusiasm what they regarded as a coming predominance of ribbed fabrics over twills. It cannot be said that that ever materialized, although poplins, reps, and Bedford cords sold to a greater yardage than in any season of the recent past. Since the present trend is away from staples it is not believed that the year now begun will show much that is conclusive in the contest of ribs versus twills. The velour in its lighter weights has held a fairly prominent position and has been seen in a number of fancy effects, including original productions in dropstitch. The vogue of the flannel for the coming season will prove helpful in keeping the velour also before the public eye.

Printing Sheer Worsteds

A development which may be considered new last spring and perhaps still in its infancy is the production of very sheer worsted cloths such as voile, challis, nuns' veiling, etc., and their promotion in a field of dress formerly held exclusively by silks and the higher grade cottons. The worsteds mentioned have been produced by a number of mills in weights and styles closely paralleling the best ideas in silks. These fine worsteds have also appeared with printed designs and, as has been shown in the realm of silks and cottons, this treatment has almost no limit to variety of possible effects. As 1923 closed there was found to be increasing interest in the printing of worsteds for women's wear. The possible production of such goods at the present is limited but if they catch the fancy of the public they will doubtless become one of the established subdivisions of the trade.

Keynotes from Paris

The influence of Paris on American styles was in evidence throughout the year, as usual, although none of the more extreme foreign effects were taken up on this side for big volume production. Paris followed its matelasse fabrics of previous seasons with a wide variety of new surface effects which were embossed, looped, cubed, embroidered, flaked and one line was shown with little wooly spheres attached at regular intervals. The brocaded effects found a place in domestic production as did also pile-fabric cubes and dominoes, but these were found chiefly in the more exclusive lines and therefore limited in distribution. It is understood that Paris is going forward with its great variety of elaborately decorated surfaces, and the extent to which the American market follows this lead will be one of the interesting and pivotal developments of this year.

Suit May Revive in 1924

The suit as an item of women's dress was more or less in the background through 1923. At the start of the year the older forms of tweed or knitted fabric suit had lost their popular appeal, and staples such as twills, coverts, poplins, etc., were the fabrics chiefly used in suit production. It may have been the lack of a new impulse which left the suit in a subordinate position through most of the year. It was interesting to note, however, that one or two of the most exclusive garment houses continued to show tweed suits. These were made of imported hand-woven fabrics and they made no impression on the domestic market as a whole. These garments may, however, have been the forerunners of the more hopeful turn which suits are believed to be taking for the spring, 1924, season. For this season there is a new note in the fact that colors and patterns reflect the general trend toward sports wear, and it is believed that this will be a sales point which will much increase the volume of retail business in suits. The fabrics utilized will be woolens for the most part, according to the present view, and it is not expected that the tailored worsted suit is due for any revival for a number of months.

The garment trade as a whole is said to have made money during the first six months of 1923, and to have lost much if not all of the early

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profits during the last six months of the year.

Price Trend was Upward

The price trend in woolens and worsteds for women's wear was steadily upward through the year despite the fact that buyers made resistance at every such step. The fall opening which was started at the close of January and continued through to the middle of March, recorded slightly higher prices than the preceding spring opening. The spring, 1924, opening which was started at the close of July and which ran along through September, recorded another upward move. During August, September and October, however, there was a fairly widespread demand for women's wear which set this market off in sharp contrast to the extreme dullness which followed the spring showing of men's wear lines. As a result of the inequality of these two markets many men's wear mills turned such production as they were able into the women's wear field. This additional yardage added to a fairly large production by established women's wear manufacturers, took the edge off the market and at the close of the year there was a feeling that both buyers and sellers had overdone in their desire to do business. There was considerable liquidation at a sacrifice among the slower moving lines, and the hope has been expressed through the market during the first month of the new year that, whatever progress may be in store, will not be retarded by too great a burden of stocks.

Successful Year in Carpets

Nearly All Lines Sell Readily—Big Auction Offering Absorbed —Imports Increase

AFTER closing what was probably the best year ever encountered by the carpet industry, domestic manufacturers are hopeful that they can repeat this experience in 1924. For the moment the retailers' unwillingness to carry much stock has brought a letdown in some lines, although the cheaper sorts of rugs are still well sold ahead, and continue to meet good consumer demand. There is no evidence that the active building of homes, apartments and hotels is slowing up as yet, and while this continues it is obvious that a strong current of new business awaits the product of carpet manufacturer's looms.

The year 1923 came in on the crest of a wave propelled by the active business of late 1922. Mills were in a sold-up condition and in many cases buyers received only a small part of the goods they had ordered for delivery during the early months of the year. The opening of lines in April recorded an advance in price which, although objected to by buyers, did not check the avidity of their demand. The price advance was necessary in part to cover the higher wages which went into effect in the carpet mills on May 1, and also to protect the manufacturer against the rising trend of his raw materials.

Market Conditions Criticised

At various times during the year dissatisfaction among buyers as to merchandising conditions in the primary market for carpets came almost to open rebellion. Scaling down of orders had forced many buyers into the speculative practice of asking for much more than they needed in the hope that they would thus get enough to cover their actual requirements. Assurance of the delivery of certain specific quantities at certain definite times is the cure which buyers see for the existing condition of uncertainty. Buyers also want a guarantee of price through a season so that they may be protected against possible reductions between the time of ordering goods from the mill and delivery to their customer. The policy of taking orders "at value" has been condemned by a number of buyers.

Retail sales prior to the inventory period at the 1923 mid-year were reported much in excess of those in the same period of 1922. The late spring extended the buying time for grass, fibre, and rag rugs. A number of retailers at this time, however, asked that deliveries of wool rugs be held up until about the middle of July so that what they had ordered would not figure in the mid-year inventory. The following months until October proved a bit quieter than expected, and, although tapestries and axminsters remained scarce in wholesale circles, velvets and wiltons were more plentiful than they had been for many months.

Successful Auction in Fall

Early fall retail buying, however, especially in the cheaper grades, proved sufficient to stimulate widespread interest and the attendance of buyers on the market during the first week of October is said by many authorities to have marked a new high record. The outstanding event of opening week was the auction by the Alexander Smith & Sons Carpet Co., of 86,000 bales of rugs and carpetings, divided as follows: 40,000 bales of axminsters, 38,000 bales of tapestries and velvets, 8,000 rolls of wilton and velvet carpetings and 1,000 rolls of axminster carpetings. Buyers spent at this auction alone $6,500,000. As a whole the cheaper rugs were firm through the sale, and weakness was seen only in the more expensive grades.

Among the mills which opened for the spring season during the first week of October were Sanford, Smith, Firth and Chelsea Fibre. Among the mills which started the new season Nov. 1, were Bigelow, Whittall and the Sloane group. Several of these manufacturers did not wait until Nov. 1 to name prices, but issued lists during the buyer's visit which were not effective until Nov. 1. Taking the opening as a whole, axminsters and velvets were the only fabrics reduced, the concession varying from 2½ to 10%. Wiltons and chenilles were firm. Tapestry rugs were advanced 4 to 5% in some quarters and unchanged in others.

Although buying was fairly general at this opening, it was not on the same complete scale which characterized the start of previous seasons, buyers covering chiefly only their immediate requirements. The same motive as noted at mid-year for the holding up of deliveries reappeared in October, for buyers were evidently aiming to make their stocks on the Dec. 31 inventory as low as possible. Demand was clearly best for tapestry rugs and the cheaper axminsters and velvets. The holiday buying in December did not materially improve the retail carpet situation, although it did result in the moving out of a large volume of the smaller sized rugs.

Cheap Orientals Imported

A striking feature of the year and a prime factor in curtailing demand for the best grades of domestic rugs was the enormous importation of the oriental product, which brought the figures for the year to one of the largest totals ever recorded. American buyers representing both retailers and jobbers, went out into the Near East and the Far East and bought up collections of rugs which in some cases included stocks held over from pre-war days. Perhaps the desire on the Oriental's part to liquidate his holdings was strong and probably the exchange was much in favor of the American buyer; in any event, most of these goods were obtained reasonably, and being sold on a close margin, appeared in featured retail sales at strikingly low prices compared with past figures on similar merchandise. It is not possible to state arbitrarily to what extent this business will continue during 1924, but the results during 1923 were impressive and they have shown the domestic manufacturer that he must not let his ingenuity lapse into dullness in the merchandising of his best grade product.

Government figures for imports of carpets and carpeting for the first nine months of 1923 as compared with a similar period of 1922 show a gain of about 25% in square yardage and about 20% in value for last year over the preceding year, if the same rate of importation continued through the close of the 12 months. The chief source was Persia with China a close second and Turkey third among the eastern countries, although Great Britain comes in third when all sources are considered.

Mill Expansion a Feature

The increase of manufacturing facilities among nearly every one of the large domestic carpet manufacturers was a feature of the year recently closed. Part of the building operations were to modernize and rearrange existing machinery, but most of it was for the installation of additional new equipment.

1923 British Wool Textile Trade

A Disappointing Year With a Belated Recovery—A Problem For Manufacturers

(From Our Regular Correspondent.)

BRADFORD, ENG., Dec. 28.

THE year 1923 started in optimistic fashion in the wool textile trade, which was then better employed than any other staple industry in the United Kingdom. Great expectations were entertained of a continuance of good employment, if not of further improvement, but these expectations were doomed to disappointment. The previous year, 1922, had seen a rapid increase in activity to a comparatively high level, and this was about maintained until the spring of 1923. Within four months there had been a set-back which reduced activity almost to the level existing at the beginning of 1922.

There are no figures of machinery activity in this country, but the Ministry of Labour unemployment figures obtained under the insurance scheme are probably as accurate as any such set of figures can hope to be, and they are an illuminating record of the trend of events. The percentages of unemployment (including a half-allowance for systematic short-time) were as follows on the dates named for the woollen and worsted industry and for the cognate branches, the hosiery industry and the carpet industry:

Percentage of Unemployment

End of:	Woolen & Worsted %	Hosiery %	Carpet %
December, 1921	15.5	4.8	10.6
October, 1922	3.4	1.8	3.4
May, 1923	4.1	4.4	3.2
August, 1923	11.2	*10.2	5.7
November, 1923	11.1	8.7	5.2

* September.

Proportionately the greatest set-back has been in the hosiery industry, because 1.8 is such a low degree of unemployment that it connotes a high degree of activity, with overtime and shortage of workers. Both the hosiery and carpet industry are important outlets for yarns, and consequently react on the woollen and worsted industry proper.

Causes of the Set-Back

The set-back was so abrupt and severe that it leads one to the conclusion that the improvement in 1922

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was somewhat exaggerated. Most sections of the trade were then operating with confidence, and tops and yarns were being bought ahead. Botanies were still favoured, but it was found that the sharp rise towards the end of 1922 carried the price of cloth to a point at which demand was restricted, and manufacturers were left with unsalable goods. The occupation of the Ruhr at length checked the improvement in trade which had manifested itself during 1922, for it simultaneously restricted shipments to Germany—our most important market for tops and yarns—and so depreciated the franc that French dress goods were imported into the United Kingdom at 1s. and even 1s. 6d. per yd. cheaper than home-made cloths.

After a sharp rise in wool values in January, hesitancy developed, and by April a complete lack of confidence had ensued. Instead of buying ahead, users of piece goods, yarns and tops adopted a hand-to-mouth policy, and reduced their commitments to a minimum. This left fairly heavy stocks of tops and yarns in the intermediate processes, whilst manufacturers were not always successful in getting rid of their cloth, particularly botanies.

Virtual stagnation continued until August, when slight signs of a recovery (coinciding with a recovery in commodity prices generally and in wool prices in particular) were visible. In November and December raw material made an extraordinary advance in value. This brought out a large amount of business in tops and yarns, and a fair amount of business in piece goods; but it was crossbreds, and not merinos, that were favoured. The position was forced from the raw material end, largely by fears of a shortage in wool.

Amount of Wool Retained

The reduced movements in wool, heralding a period of limited supplies, are very clearly shown in the returns for the United Kingdom.

The simplest way to indicate the position is to give the following summary table, in which the 1923 figures are estimated from the returns up to November:—

Wool Movements

In million lb.	1923	1922	1913
Imports foreign & Colonial wool	735	1,106	801
Re-exports ditto	415	448	307
Balance retained	320	658	494
Balance British clip retained	45	40	95
Reduction in BAWRA'S stocks in United Kingdom	190	86	..
Total retained	555	784	589

The final total represents the amount retained by the trade. Stocks in trade hands at the end of 1923 in this country were less than at the end of 1922, so that the actual machinery consumption was probably greater than 555 million lb., and about equal to 1913. In 1922 the reverse was the case, and the 784 million lb. did not wholly represent consumption.

The course of wool values is clearly shown by a few prices taken from the figures of Messrs. Kreglinger & Fernau, which show London values for combing wool (first cost, clean, London, without oil):

In pence per lb.	July, 1914	Dec., 1922	July, 1923	Dec., 1923
70s super fleeces	32	61	64	68
64/67s good med. fleeces	30½	55	58	62
60/64s good med. fleeces	30	50	52	57
56s fine crossbred fleeces	26	36	40	44
46/50s crossbred fleeces	18	23	21	27
36/40s crossbred fleeces	15½	12	14	17

Wool values ruled higher than in 1922, and at their lowest ebb did not fall to the level of December, 1922. There was a lull from May to August, and a very sharp rise towards the end of the year, leaving values at the highest point since the slump.

Tops did not quite hold their ground in relation to wool during the middle of the year, but there was a sharp recovery towards the end, as the following table shows:—

In pence per lb.	July, 1914	Dec., 1922	Aug., 1923	Dec., 1923
70s merino	33	65	62	67
64s merino	32½	62	60	65
58s crossbred	26¾	46	42	51
56s crossbred	24¼	36	33½	44
50s crossbred	20¾	26	24½	32
46s carded	17	17½	17¼	23½

In the case of yarns, there was a substantial reduction in margins during the period of depression, and for many qualities, whilst wool was holding its ground, yarns were continually depreciating. Prices for a few qualities are shown below:—

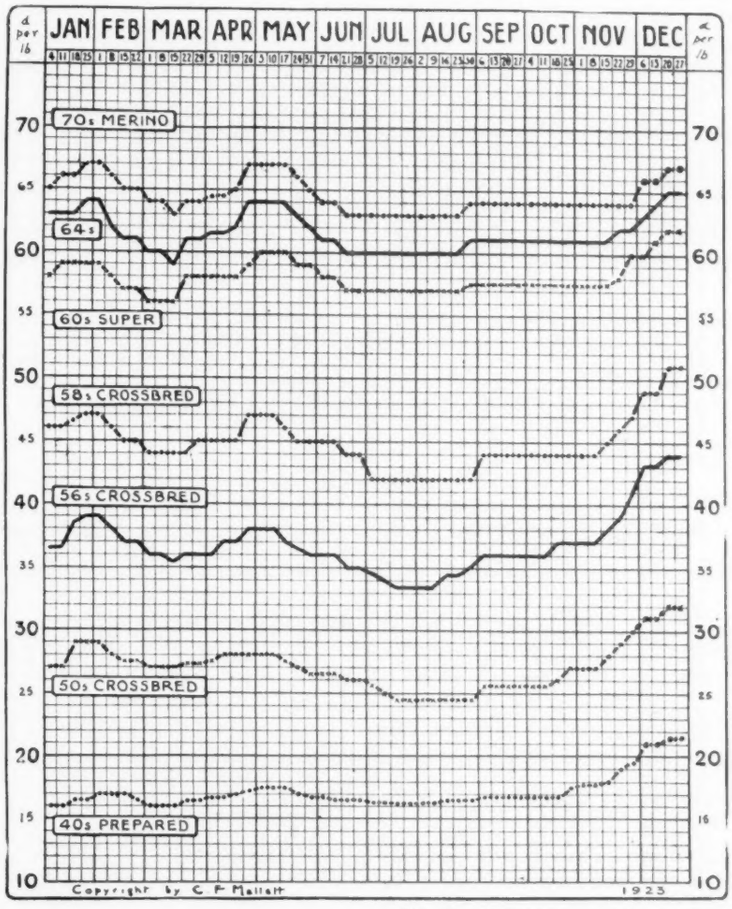
Per lb.	July, 1914 s. d.	Dec., 1922 s. d.	Aug., 1923 s. d.	Dec., 1923 s. d.
2/16s Worsted medium	⅛	2/2	2/1	2/6
2/32s Worsted medium	1/10	2/10½	2/9	3/-
2/40s (56s tops)	2/10½	4/9	4/2	4/8
2/48s (64s)	3/3	6/10	6/3	6/7½

It will be noted that whilst merino wool is definitely dearer than a year ago, and even tops are appreciably higher, botany yarns have not recovered to the level ruling towards the end of 1922. This is almost entirely a question of margins, because wages during 1923 have remained virtually unchanged.

Home and Export Trade

Employment in the combing and spinning branches has been chiefly affected by the hand-to-mouth nature of buying, the reduced demands of the hosiery trade, and reduced shipments to Germany; whilst the merino branch has been handicapped by cheap imports from France and a lessened total demand.

The character of the trade in manufactured goods has changed completely during the year. Twelve months ago, botanies were still the vogue, and gabardines were a staple article. Now, although of course there are still normal outlets for botany productions, the popular demand for them which has been a feature of the post-war period has definitely waned, mainly through the influence of price, but partly from the desire of the feminine customer for a change. Crossbred fabrics have come into their own. Cheapness in the final cloth is now quite as important as stylishness. Marocains have enjoyed a good deal of popularity, though manufacturers complain that they are prodigal of wool and entail very little labour and employment in the making. The men's wear trade suffered equally with the women's dress goods trade during the second and third quarters of the year, especially the fine worsted branch of the Huddersfield district. On the other hand, woollens have improved their position relatively to worsteds in almost all directions, particularly in the medium and coarser grades.



By C. F. Mallett, Bradford, Eng.

Chart Shows Course of Prices of Wool Tops at Bradford (Eng.) During 1923.

The Outlook

Raw material dominates the outlook. The sensational rise in values towards the end of 1923 was due in the main to fears of something like a wool shortage in 1924. It is evident that these fears are not groundless. B. A. W. R. A. has sold about 700,000 bales during 1923, whilst current clips have been cleared and also a certain amount of surplus stock in South America. During 1924, B. A. W. R. A. will have only 200,000 bales to sell, and there is a decline of 350,000 bales in the Australian clip. All in all, there will probably be a million bales less wool for the trade in 1924 than has been bought in 1923. Stocks in the hands of the trade at the end of 1923 are light—particularly so on the Continent.

For physical reasons, therefore, the world's wool machinery cannot maintain the activity of 1922, because there is not sufficient virgin wool for the purpose. There is likely to be machinery-hunger for raw material. Though the rise towards the end of 1923 has been exceptionally rapid, and though it contains elements of speculation which may cause temporary set-backs from time to time, there is little doubt that the advance in crossbreds was long overdue, because qualities up to 56s, even after the rise, do not show as great an advance over 1914 as commodity prices generally. In other words, they have not kept pace with a general rise in nominal prices which has been due in the main to currency depreciation. The betterment of crossbreds makes merinos relatively less dear, and in any case the decided shortage in the supply of the finer wools is at least equal to the diminution in demand. It is generally expected that fine wools will fully hold their own during 1924, and that crossbreds, particularly the lower qualities, may show some further advance underlying the usual ebbs and flows.

Manufacturers, therefore, are faced with a difficult problem. Raw material is forcing the pace and is dearer than tops, whilst tops are dearer than yarns, and yarns dearer than cloth. Partly this is due to the invariable time-lag in passing on advances, assisted by wise speculation throughout the trade. The time must come eventually, however, when replacement costs will rule the price of the finished article. It is inevitable that higher prices for cloth must restrict the demand in one quarter or another—indeed, it is imperative that it should, because there is not enough wool to keep machinery employed at the rate of the past year.

Manufacturers, indeed, will probably be faced with great difficulties—dear wool on the one hand, restricted demand for dear cloths on the other—and this will keep margins low.

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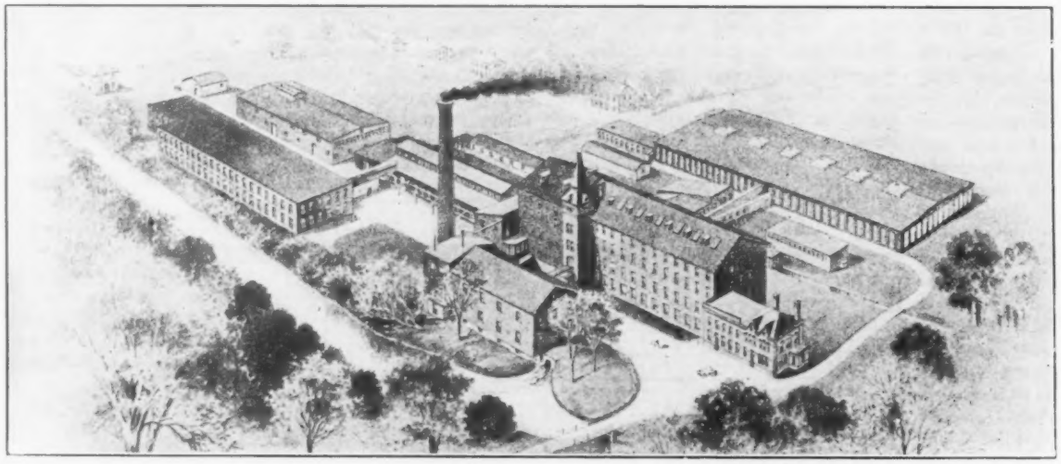

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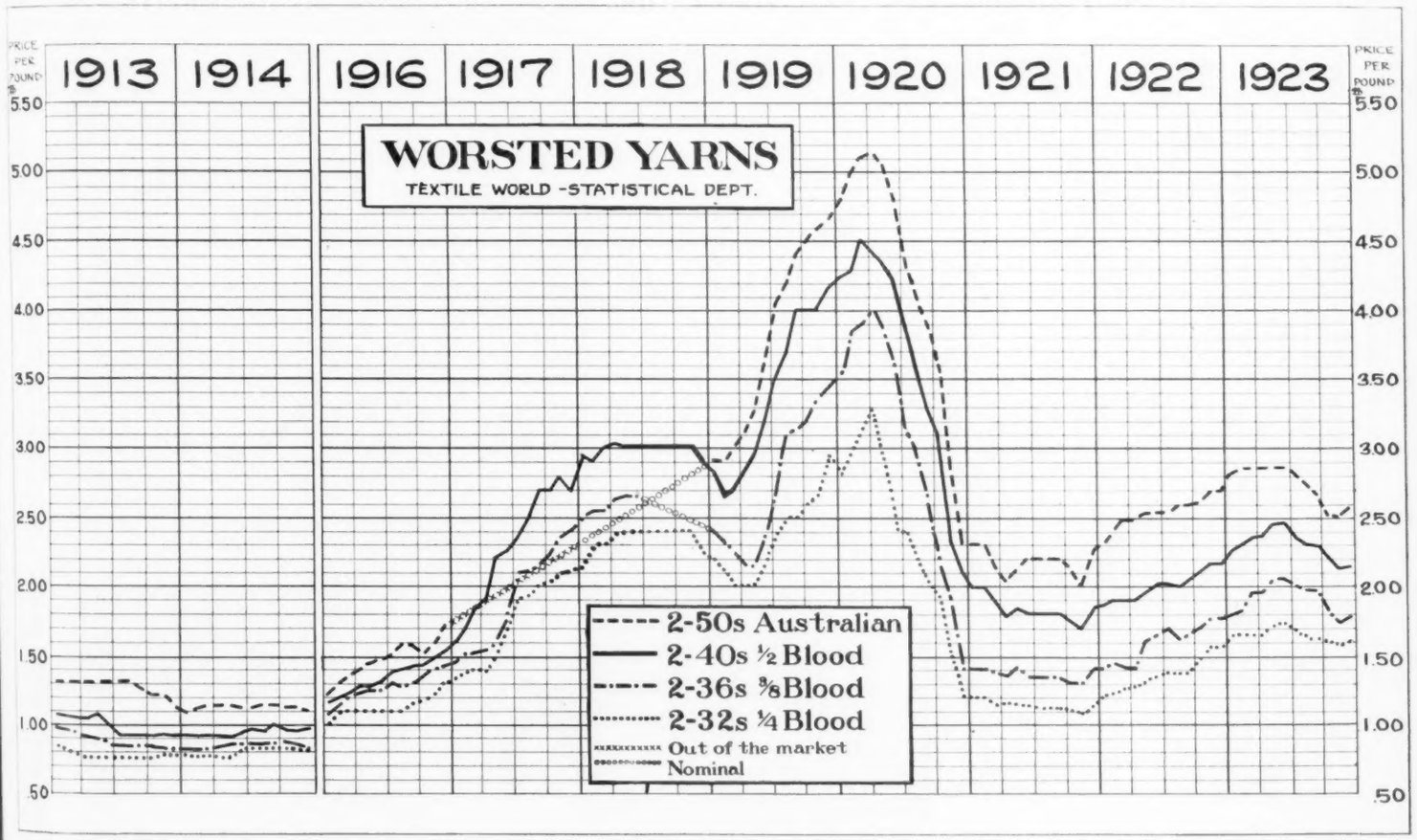
Worsted Yarn Fluctuations Radical for 1923

Decreases Follow Increases with Monotonous Regularity—Upward Movement for First Five Months—A Downward Course Marked Prices During Latter Part of Year—Consumers Buy in Hand-to-Mouth Manner in Last Half—Prospect for Coming Year Regarded as Favorable to Increased Business

CONDITIONS in the worsted yarn market at the beginning of 1923 were similar in several respects to those which confronted the trade in January of the present year. The chief interest was the approaching opening of the heavy-weight season, with little activity displayed by purchasers of yarn. This is true of the current situation. Prices current in January, 1923, on many counts bear a striking resemblance to those noted early in the present year. For example 2-40s half blood were selling at $2.15 to $2.25 early in January, 1923, which is the average reported in sales made early this year. Many other counts and qualities sold at practically the same prices at the beginning and end of the year.

Quotations during the entire year, however, did not remain stationary, but had two distinct major movements, the first of which lasted for the first five months of the year or until the start of June, prices becoming continually higher. This was caused in no small degree by the constantly rising wool market during this time; fine staple Montana, scoured basis, rising from $1.40 to approximately $1.54, while other grades increased in almost the same proportion. The latter part of the year witnessed prices of yarns generally on the down grade, falling rapidly in many instances due to a severe contraction in the volume taken by manufacturers, particularly men's wear mills. In November prices became slightly firmer, due largely to higher prices paid for wools, not only in this country, but to a greater extent in all foreign sales held at that time. The year closed with quotations a little above the lowest point reached late in the autumn.



Operations Decline at Year End

Spinners are believed to have experienced a rather ordinary year in many respects. While the majority secured a large amount of business in the early months of the year, on which a fair profit was possible, the latter part of the year brought conditions practically the reverse. Demand for yarns dropped drastically, resulting in spinners lowering their quotations to a level at which it was merely a question of keeping their losses as small as possible and of accepting orders at less than replacement values. The purpose was to keep their machinery running even though at a loss on current business, so their organization would not be disrupted. Spindle activity was at approximately 95% single shift capacity on worsted yarns early in January, which shortly after started to increase, reaching 110% in the latter part of March, the best period of the year for spinners in regard to active spindles. From this time demand fell off rapidly causing a decline in spindle activity from the high point to 80% reached in August. A seasonal increase occurred in September and October when at times 87% of the spindles on worsted yarns were engaged, the year closing with activity below this, estimates for December being about 80%.

During a large portion of the year a good demand for knitting yarns wa maintained, for outer-wear, jersey cloth and kindred products. Many spinners of weaving yarns changed their entire equipment over to the production of knitting yarns, and knitting spinners who heretofore operated also on weaving yarns, increased the knitting yarn output so largely that prices were held down to low levels in comparison with current wool costs, large quantities of yarns being sold at almost actual cost to spinners. This fact prevented other spinners from raising their quotations to a more profitable basis during the latter part of 1923 when the demand for knitting yarns, particularly for brushed-wear reached the highest point. Prices of knitting yarns in comparison with those a year ago are similar, while other counts are 5c. lower than twelve months ago.

The close of 1922 found spinners of weaving yarns with a good amount of orders on their books. While they were not fully sold up sufficient business was on hand to keep them well

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engaged for several weeks. Much of the business placed was for three-eighths and half blood yarns. Dress goods qualities were purchased in larger volume than men's wear; popular counts at this time were 2-50s and single warp French spun yarns. Prevailing prices at this time were $1.75 to $1.85 for 2-36s three-eighths; $1.60 to $1.70 for 2-32s quarter blood; $2.15 to $2.25 for 2-40s half blood and $2.70 to $2.80 for 2-50s. In January, 1923, increased interest was manifested following the holiday period, resulting in several manufacturers placing considerable yarn business particularly by dress goods mills, sales being made at $2.65 for 2-50s. By the latter part of this month manufacturers were ordering additional yarns to cover duplicate orders which they were receiving for light-weight goods. This fact, together with the advancing prices of fine wools, caused spinners to raise quotations as much as 10c. a lb., sales being made at the increased level, which brought yarn prices to a parity with wool values or more nearly so than existed previous to this time. Sales of 2-50s were reported at $2.60 to $2.70 and 2-40s half blood at $2.35 and single French spun 40s at $2.37½.

Small Advances Effective

The attention of the trade was now turned to the opening of heavyweight goods for the next season. The advances named were moderate, being less than the majority of factors had anticipated; based upon replacement costs many felt prices should have been considerably higher. Nevertheless the policy adopted was thought to have been good business psychology in that it afforded spinners a better opportunity to get started without the handicap of severe advances, making it possible for goods manufacturers to raise prices later should these become necessary due to further advances in raw materials. The main factor in the situation at this time was not the low prices seen at the openings but rather the strong wool market, a shortage of supplies and higher prices for practically all grades of wool in foreign markets.

World Demand Causes Advance

Early in February sales of 2-36s half blood were made at $2.35, while 2-50s were sold at $2.65. Single yarns for warp as well as filling commanded the greatest interest. Worsted spindles were working at approximately 96%. At this time there was considerable apprehension concerning the occupation of the Ruhr section of Germany. Before the war this territory was a large consumer of Bradford and French spun yarns. It was estimated over 100,000,000 lbs. of worsted yarns were used in normal times. Several factors believed restrictions upon the export trade of Germany would materially effect these industrial centers and thereby largely curtail their purchases and consumption of wool. It was felt such a result would have a serious effect upon world wool values, affecting the American market to a large extent at the same time. It was unforeseen at this time that France, Japan and to a lesser extent Germany herself would come into world markets and purchase sufficient wool not only to prevent wools from going lower but to cause values to rise during the latter part of the year, notwithstanding the relatively small demand from America for foreign wools during this period.

March witnessed a broadening interest particularly from men's wear mills. Manufacturers discovered they were able to realize more than they had anticipated in the matter of prices for their goods. Quotations of 2-36s three-eighths reached $1.90 to $2.00, 2-40s half blood $2.30 to $2.40 and 2-50s fine $2.75 to $2.85, which shows a decided increase over those current during the previous month. At this time the demand ran largely to 2-32s quarter blood and three-eighths and 2-36s three-eighths to such a large extent many spinners were not able to accept all of the business offered them. The industry at this time was operating at a good rate, considerably over 90% single shift capacity, spinners claiming to have taken orders at a level well below replacement costs. Quotations remained steady during April in the presence of increasing wool values, together with the fact that spinners generally increased wages at this time. Toward the latter part of the month higher quotations were made, 2-50s, 64s and 66s, at $2.80 to $2.90; 2-40s, 60s and 62s, at $2.50 to $2.60. Large purchases of both men's wear and dress goods yarns were made, the former using 2-36s and 2-40s in white and vigoureux mixes, while dress goods mills requested 2-50s out of 66s and single 30s warp and filling. Spinners were well supplied with orders, reaching the highest point of activity during the year, approximately 110%.

English and German Imports

From this level production began to decline, while dealers reported a distinct falling off in demand from manufacturers, who appeared less willing to pay spinners' asking prices for yarns in most active demand. Quotations of all grades were now considerably higher than at this time in 1922. Advances, however, had not been uniform, some coarser grades of yarn not having risen in the same proportion finer counts had experienced. Manufacturers now began to look for cheaper qualities, which later in the year made its effect felt in the greatly increased demand for yarns made from medium wools, causing eventually the raising of low wools and cheaper quality yarns in proportion to higher prices for finer qualities during the first half of the year. Quotations had reached a level which permitted importations in considerable amounts from England and Germany; one dealer claimed to have imported a lot of German spun 2-50s 64s quality at a landed price of $2.65, while spinners in this country were refusing to accept orders less than $2.85 or $2.90.

Manufacturers now began to receive cancellations on goods in several instances, particularly in dress goods lines, which made them reluctant to make further commitments in yarns, resulting in a decrease in spindle activity to 95% in June, later declining to 90% by the first of July. Buyers followed a hand-to-mouth policy, feeling this advisable when cancellations for goods were coming in, sold at prices based upon yarns bought at lower figures than could be bought at this time. They also looked with foreboding at high prices which were being paid by several large factors for new wools in the West, knowing this would mean still higher prices for yarns, when they were unable to dispose of goods based upon cheaper purchased yarns. Spinners were asking $2.40 to $2.50 for 2-40s half blood during the month of June, although it was noticeable several began to shade prices slightly in order to attract additional orders.

Fall Buying Larger

An increase in buying after the summer months resulted in raising the spindle activity to almost 83% in September. The amount of business, however, was not of large enough proportions to cause any strengthening of prices. Buyers made the most of this condition, purchasing in many instances 20c. below the prices named by spinners. The majority were now completing yarn orders placed earlier in the year and were now endeavoring to secure enough new business to run them during September and October. Prices in September were $1.60 for 2-32s quarter blood; $1.90 for 2-36s three-eighths; $2.25 to $2.30 for 2-40s half blood and $2.50 to $2.65 for 2-50s. An encouraging feature in the market at this time was the opening of the London wool sales, which resulted in better prices than were anticipated, causing spinners in this country to feel considerably encouraged over the outlook. The point was now made prices of wools in this country were 12 to 14c. less than the prices paid abroad plus duty, on a scoured basis. Weaving yarns however did not respond to this impulse, men's wear mills being in need of orders to keep them running. Dress goods mills remained in a somewhat better position, placing fair sized orders for 2-40s, 2-50s and French spun single warp yarns. It was a buyer's market. A dress goods mill secured a quantity of 2-50s at $2.45 in October, the lowest price noted for this yarn up to this time. Several sales of 2-40s were noted going to this trade at prices below $2.15, although the majority of spinners were now asking $2.27 or more.

Dress Goods Yarns Wanted

By November the demand for dress goods yarns decreased to a large degree; up to this time it had presented the brightest spot in weaving interest. The effect of this was soon noticeable in 2-50s used largely by this trade, which declined to $2.35. Considerable quantities of weaving yarns spun in England and Germany were offered at prices, landed in this country, 10 to 15c. lower than domestic spinners would accept, which did not improve the spinner's position. Lack of orders had caused a further decline in quotations at this time. Prices ranged from $1.55 to $1.60 for 2-32s quarter blood; $1.70 to $1.80 for 2-36s three-eighths; $2.15 to $2.25 for 2-40s and $2.35 for 2-50s. All buyers were confining their purchases to small amounts, pursuing a hand-to-mouth policy due to a lack of faith in yarn prices.

Prices Radically Lower

Buying during the latter part of the year was of such small proportions, spinners did not receive sufficient orders to take their normal production. They found it more desirable to continue to spin yarns for stock rather than permit their organizations to disintegrate. This resulted in the accumulation of stocks of standard counts made during the dull buying period, which spinners found it more advantageous to move at low prices than to carry in stock. This condition resulted in severe competition and a radical lowering of prices during the latter weeks of the year. Spinners sold at actual cost or less in many instances to lower the amount of yarn they would have on hand at the taking of inventories in December. It was possible at this time to place orders with spinners for half blood 2-40s at $2.00, which represented a decline of approximately 50c. from the high point reached. Yarns in many instances were selling below replacement costs, based upon wool values current at this time. The final weeks of the year witnessed a gradual strengthening of quotations to a small extent due to firmer prices paid for wools, particularly in the medium grades. This fact caused many spinners to endeavor to raise their quotations in proportion, which actually proved to be of small benefit to them, as buyers refused to purchase in any important volume before prices were raised.

Knitting Yarn Activities

Knitting yarn spinners generally have experienced a better volume of business during the year than weaving; this is particularly true of the latter half of the year, when the demand for weaving yarns declined greatly. Many spinners changed their entire production over to knitting yarns exclusively to take advantage of the active demand from knitting trades. Brushed wear proved to be an exceptionally good seller in the fall months, causing manufacturers to place more orders than several of the larger spinners could accept. Although a large amount of business was placed in these yarns in a relatively short space of time, spinners were confronted with a condition, which practically precluded them from raising their quotations.

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at this time. Due to the fact large spinners in several instances were anxious to secure a quantity of business quickly, or who had cheaply purchased wools on hand, continued to sell at prices that represented actual cost to other less fortunately placed spinners. The demand ran largely to yarns made from low quarter or common wools, which would brush well.

At the beginning of the year 2-20s, average quarter blood sold at $1.46 to $1.50 and 2-30s at $1.68. Sales at this time were unimportant so far as future orders were concerned, although spinners were well engaged on old business for sweaters, mufflers, toques, dresses and capes. Interest was displayed in 2-20s from 44s South American, also 2-24s and 2-26s at prices around $1.25, being in many cases for use in making mohair effects and other novelty fabrics. Hosiery trades were not active buyers of yarn during the early months of the year, confining their purchases to small quantities, calling for single 40s and 50s, in white, heather and the various combination twists. Jersey cloth yarns were in steady demand, especially good quality half blood single 26s. The middle of the year found a quiet demand from knitters, with spinners becoming anxious to book future orders, resulting in some price cutting. Late in July 2-30s quarter blood sold at $1.65, in several sales reported.

In the fall months interest developed in 2-18s, 2-20s and 2-26s, for use in brushed goods; 2-26s, 44s grade sold at $1.35 with other counts on this basis. Spinners claimed this business showed little or no profit, being taken in many cases to keep their machinery fully engaged and their organizations intact, with the belief better priced orders would be available later. Yarns used in making astrakan goods were in good request, in 2s and 6s, and 2s and 7s, at $1.05 to $1.15. Several spinners secured sufficient business to run their mills night and day by the middle of September, with enough on hand for two months in advance, in some cases. The bulk of the business was placed at $1.10 to $1.15 for 2-20s low quarter and $1.40 to $1.45 for average to high quarter. The last week of October witnessed the beginning of a decline in brushed wear demand, which had taken enormous quantities of yarn up to this time. Interest continued to fall during the latter part of the year.

While brushed wear yarns became less active, a broader inquiry started in French spun hosiery yarns, particularly for 1-60s and 1-70s, which sold at $2.85 and $3.50. The uncertainty of future supplies of silk, because of the Japanese disaster, caused an increased interest in worsted yarns from hosiery mills. Single yarns for Jersey cloth sold well during November, particularly single and 2-ply 26s. During the final weeks of the year old orders expired and many were not renewed, many manufacturers requested postponement of deliveries until after the first of the new year. Price became slightly firmer at this time due to higher prices paid for new commitments in raw wool used in making these yarns.

Prospects Favorable

The market as a whole closed the year with favorable prospects for a good volume of business during the coming twelve months. Prices displayed a tendency to rise in January largely because of the higher wool costs that spinners were compelled to pay for wool or tops, particularly so in medium grades, which were in active demand not only in this country but abroad. This was considered good evidence of a firm basis of current quotations, showing that if demand increased prices would in all probability become stronger. The feeling was prevalent retailers and jobbers who had endeavored to keep their stocks of all goods at an extremely low level would see the advisability of ordering some goods ahead, finding yarn prices based on wool costs, would probably increase further, making any postponement of new commitments unprofitable for them.

It was thought no large stocks of manufactured goods existed at this time. Jobbers and wholesalers were felt to be in such a position that any new movement of goods would necessitate them placing additional cloth orders quickly in order to have a selection to offer their customers in the new lines. Under these conditions, an absence of large inventories by any branch of the trade, and of speculation that might possibly cause prices to reach unsound levels, it is thought a good volume of orders will be placed by worsted yarn consumers in the near future. From a raw material standpoint indications point to no decline in desirable spinning wools, but rather to a further hardening of quotations, that will mean yarn purchased during the early months of the year will probably show the buyer a fair profit before the entire order has been made into goods. This assumption is simply based upon a continued firmness in wools, which is felt to be conservative opinion when the shortage of desirable grades is taken into consideration, and not upon any increase in demand which would give spinners the opportunity to raise quotations to a replacement basis. The majority feel the business of the present year will show a material increase over that done during 1923.

Wool Tops Close Year Firmly

High Wool Values a Continuous Obstacle in the Way of Meeting Spinners' Views

THE market in tops during the year 1923 was quite irregular and in the nature of a continuous struggle for satisfactory business under conditions of a generally bullish wool market and a persistently bearish yarn market. For the first four months of the year business was fairly good at firm prices, but from May to October a continuous decline was in progress, finally arrested by strong advances in primary wool markets allowing the top market to come to the end of the year at approximate level ruling during January. Better business in tops at the level now established, based upon strong domestic and high foreign markets, will depend entirely upon the character and success of the January heavy-weight opening.

The course of the market throughout the year is indicated by the following comparison of average monthly prices for tops and noils, opening, early high, low and closing:

	Tops		Noils	
	Fine	Quarter	Fine	Quarter
January	1.75	1.09	.91	.66
April	1.80	1.10	...	...
October	1.69	.99	.70	.46
December	1.73	1.10	.80	.58

The noil market came to a strong close at the end of 1923 with street trading rather active but mill consumption somewhat dormant. On completion of inventories larger mill purchasing was anticipated and as the foreign markets were too high to allow of large imports it seemed not unlikely that before January was over, if any demand at all appeared, the better grades of noils would be selling appreciably higher. The general level of prices in noils was still below the opening of 1923 but at that time mill demand was very good and broadening every day, whereas at the close of 1923 the noil market was in the process of recovery from a rather long continued depression shared with wools, tops and yarns. As the outlook for the next month or two does not contain any promise of larger supplies, it seems altogether credible that in the near future choice fine noils will sell at 90c. per lb., the price of the opening of 1923.

Noil Imports Increase

Import statistics covering noils and wastes exported from Bradford to the United States for September-November show a large advance for November as compared with September. Value of imports in pounds sterling were as follows: September 29,098; October 47,136; November 132,159. In November, 1922, imports were valued at £194,584 but at that time wool manufacturing was proceeding at high rate. The import movement so far as noils and wastes are concerned is gaining momentum on the prospect of a fairly successful heavy-weight season.

The only feature of the market at the beginning of the year was the larger interest shown in medium tops which seemed to indicate that worsted manufacturers expected a good season in fabrics constructed from these qualities. The noil market opened the year confidently anticipating a continuance of the good business that marked the entire course of 1922 with the exception of the closing weeks of the year, when a seasonal quietness prevailed. Dealers recognized the fact that noils had had a strong advance and that some readjustment of parity between fine and medium qualities might take place. As a good woolen year was considered a moral certainty, noils used largely in that industry were expected to encounter a good demand.

The action of the top market showed a strong situation. Tops grading from average three-eighths blood up to fine advanced approximately 1½%, and crossbreds were all very firm. A peculiarity of the situation was that high quarter blood tops were not maintaining themselves. For two successive weeks they had been marked down, quotations at the end of January being $1.07-10. The advance in the finer varieties was due to the strength in Boston wool prices following higher foreign markets for merinos and near-merinos.

Top makers were struggling with a confused situation in transportation. Several snowstorms following together had made it almost impossible to truck out material into the surrounding country. Some mills within a range of say 40 miles of the city were unable for days either to receive or deliver goods. Three-eighths blood-varieties seemed to constitute the center of interest. Australian tops 70s were quoted around $2.00 and 64s at $1.85. Such had been the scarcity of domestic wool of the finer grades that one or two prominent top-making establishments had been compelled to utilize a good percentage of Australian merino in the manufacture of their so-called domestic half blood and fine tops.

The feature of the noil market about the middle of February was the strong demand for mohair noils, which had advanced since the first of the year approximately 10c. per lb. Good buying had appeared since the heavy-weight opening. The American Woolen had been a big purchaser and eight or nine other mills were also in the market for mohair noils. Coarse noils were quoted 35-40c.; medium 65c.; while kid noils brought $1.00 a lb. or over. Good business was done in camel hair. This was a fibre, growing in popularity, finding large use in women's wear materials, scarves and other articles of clothing. First combing coarse was quoted 85c.; medium $1.00; fine $1.30. Recombed qualities ranged from $1.35 to $1.60.

Bradford Fines Slump

Declines in the Bradford market had not affected Summer Street quotations. Two reasons were given for the slump in 70s and 64s in Bradford. It was pointed out in the first case that the margin between wool on the

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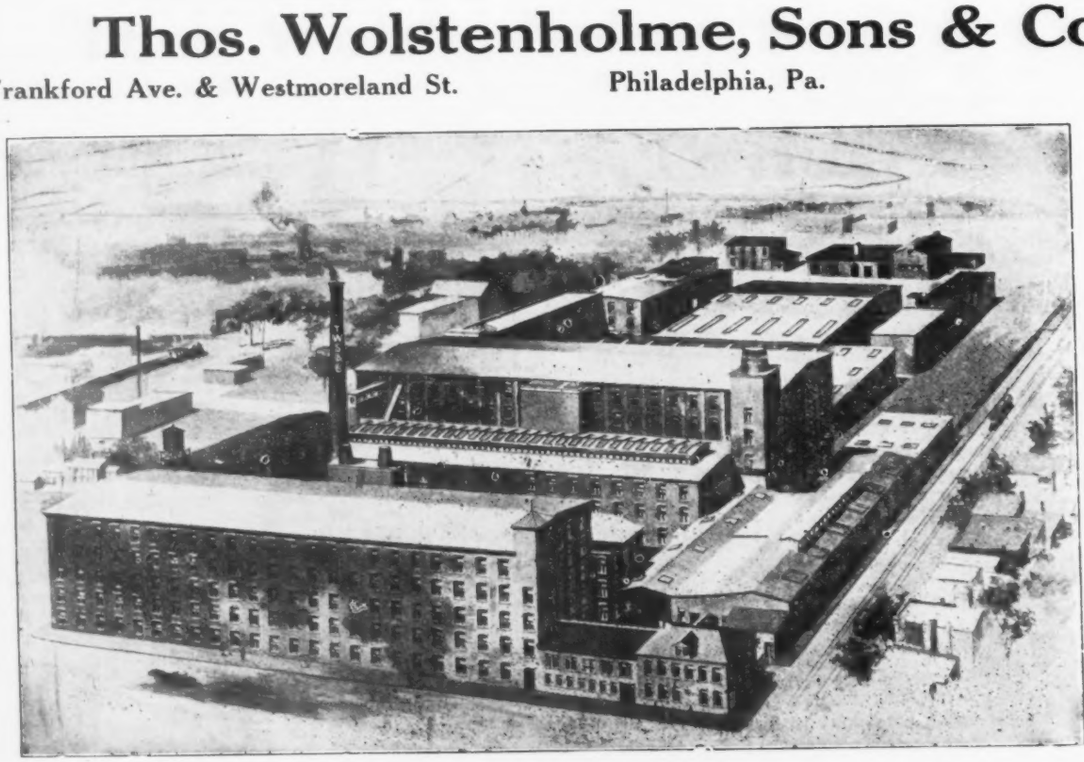

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clean basis and the finished tops was even larger than obtained in the Boston market in spite of lower British manufacturing costs. The second explanation covered the flooding of the Bradford market with French and Belgian dry combed tops at low prices on account of the urgent demand of those manufacturers for cash. It was a surprising matter that domestic fine noils experiencing moderate demand only and meeting competition also from imported noils, were able to maintain themselves about 90c. The underlying reason was to be found in the very limited stocks of domestic fine wool in this country and the high prices importers were obliged to pay for fine foreign wools.

Early in March foreign materials were arriving in larger quantities. The Bradford market for some weeks had been on a level which allowed American purchasing. The inflow of foreign noils had not brought about any weakness in quotations for noils of domestic make. The explanation was that mill demand was equal to the absorption of all domestic-made noils and in addition fairly large quantities of imported materials. Dealers were scouring the market for mohair noils and finding few. Top makers shaded prices of fine tops slightly and lifted prices for 41s. In the case of fine tops larger quantities of Australian wools were available at slightly better prices than were asked for the balance of the old domestic clip. The Bradford top market was also showing greater activity at advancing prices. Low quotations for 64s ranging from 59 to 60 pence had been withdrawn and 64s warps was now quoted at 61 pence.

From the standpoint of the actual top producer the April market was very firm; there were, however, tops handled by dealers and also imported foreign tops purchasable below the market. Prices of tops manufactured by dependable domestic producers held very firm. Buyers interpreted the wool situation at the time to preclude lower prices for either wool or tops. Noils were quiet with a good undertone. The market was composed almost entirely of transactions between dealers and the smaller houses. Large concerns who were themselves producers or who handled exclusively the production of large mills were doing very little.

Tops imported into Summer Street during the weakness in the Bradford top market were competing with medium grades of domestic makers. Bradford 48s were offered at 88-90c., and were considered equal in quality to the domestic made 46s quoted 95-96c. Bradford 50s were offered at $1.00 and were considered as a fair substitute for domestic high quarter blood tops, quoted $1.09-10. The merchandising of wool noils had lost much of its activity and although prices were on a lower level new buying had not materialized. Mohair noils continued in good demand. Imports of mohair noils as well as of mohair yarns had been large since the first of the year, yet mill consumption had kept well up to supplies. Camel hair was a good seller, and cashmere and artificial silk noils were also finding favor with mill buyers.

May Specialty Market

May was a quiet month. Apart from specialty noils, trading was slow. Mohair noils held firm and demand for all clean grades was strong. There had been an immense amount of mohair used in manufacturing for year to date. Domestic supplies had been altogether insufficient to meet the call of mills and large importing had been done both in yarns and noils. Camel hair, an entirely foreign product, was scarce with high prices asked for choice recombed material. There were spot lots of tops on the market also foreign tops, cents a pound below prices asked by standard domestic makers. Regular combing establishments stated that they had to pay such high prices for wool in the primary markets as well as in Boston that they could not see their way clear to marking down tops to a lower level. They were, however, willing to concede a cent or two a pound here and there and were in this manner able to secure business at these slight concessions.

June found spinners and manufacturers out of the market, not by any concerted movement but through their common desire, instinctively and automatically expressed, to see a lower level for tops. Top makers with their eye on the wool market could not see things in this way. Noils were uneasy. Producers had marked down high three-eighths blood from 70-72c. to 68-70c., and average three-eighths blood from 64-68c. to 63-65c. Good fine noils sold around 80c.

Manufacturers "Bear" Market

Manufacturers were endeavoring to "bear" the market, offering business from 7 to 10c. a lb. below producers' asking prices. Combers were willing to meet the situation and to make such compromises as might be possible considering the strong situation in wools, but would not consider making tops at a loss which would inevitably occur if standard combing establishments had to meet the low bids of spinners. The wool market offered very little encouragement in the direction of lower prices but was not quite so firm as it had been, some grades of wool being purchasable at rather lower prices. In the Bradford market 64s warps were firm at 62 pence; 60s, 56s and 50s were down 1c. per lb. The situation in Boston and Bradford was very similar; top makers desirous but unable to meet views of spinners.

The market at the end of June was under pressure from spinning interests who objected strongly to paying high prices for tops even though they were willing to admit that the top maker was sailing very close to the wind and doing business on a small margin owing to the high prices demanded by the wool market. Top prices were more nominal than real. There were spot lots of crossbred tops available at prices considerably below the market. Trading in noils was rather brisker on the street but at the expense of prices. More than the operations of traders was needed to lift noils to higher levels. Stocks were quite large and mill demand was quite small. There was some little purchasing by mill interests, but confined largely to fine noils, which were selling to consumers from 75 to 78c.

Fines Soften, Crossbreds Stiffen

Large business was offered at about 5% below published quotations on the finer grades of tops. Combers are doing their best to meet the situation and fine tops could be purchased near the end of July at $1.75 and half blood at $1.60, but no large amount of business was placed. There was a tendency for the finer grades to soften and for the lower crossbred tops to advance. Crossbred tops 36s, 40s and 44s were marked up 2c. a lb. Large business had been done in high three-eighths blood over a considerable period, and there was still considerable contract business on the books. These commodities were quoted $1.40-42. Low three-eighths blood tops were considered the cheapest top in the market and altogether out of parity with the others. There had been little call for these tops except from knitters.

Low bids were made for tops of the finer qualities in August by speculative buyers. Top makers could not take on such business for the obvious reason that the wool market afforded them no opportunity for purchasing cheap wool. It was possible occasionally to pick up a lot of top-making wool to advantage but no volume was obtainable. High quarter blood tops were marked down a couple of cents and were now quoted $1.00-05, business being accepted near the lower figure.

Combing Curtailed

Overtime had ceased in some of the combing plants in September, with stocks tending to accumulate awaiting delivery orders. Spinners were still claiming that quotations were too high, that they could not get out whole on prices offered for their yarns. The men's wear business continued very slow and until this picked up the top market could hardly except to do very much better. Fine noils were neglected in favor of medium to low noils. Prices for these latter commodities were very irregular, but some substantial buying appeared in the market, imparting strength and leading graders to believe that the buying by the big organization would shortly be followed by larger purchasing on the part of independent mills. For the greater part of the year colored noils had been entirely neglected. But there seemed a distinct trend developing with colored materials coming to the fore. The finer grades of mohair noils continued in fair demand at good prices. Inquiry was being encountered from western knitting mills for medium noils. Dealers were trading among themselves in three-eighths blood at from 55 to 58c., which meant a price of 59 to 63c. for mills. Half blood noils were inactive. Fine noils were a little firmer and ranged from 68 to 75c. Some parcels of choice recombed colored noils were on the market. The price asked was around 78c.; with a choice recombed black noil offered at 80c. This class of material had been conspicuous by its scarcity and was generally considered a valuable by-product since it was entirely free and the fibre quite lengthy.

Noils Handicap Tops

The top market was distinctly better in mid-October but combers were handicapped in their desire to lower quotations for tops by the prices at which noils were selling. The better classes of noils were too low in relation to the wools from which they were combed. While the men's wear business was slightly better, the main support of the top market was coming from knitters. New Zealand 36s were advanced 2c. a lb. Strong demand for this type of top was from astrachan manufacturers. Business in the noil market, so far as mill purchasing was concerned, was confined to medium grades. Following the movement in wool and tops for quarter-bloods and below, medium noils had caught the step and were in better demand, particularly choice quarter blood noils which sold around 50c. Fine noils continued quiet with production of the same diminishing rapidly.

Year-End Improvement

As the year drew to a close the top market experienced a little better business for the finer qualities. Prices were firmly maintained and top makers were able to book new business in fine tops at $1.70 and in half blood tops at $1.35. Three-eighths blood tops were in moderate demand while high quarter bloods were selling with comparative ease around $1.10. Top makers looking around for further wool supplies stated that they encountered a strong situation with wool men holding the reins, but on the other hand they found it difficult to get spinners into line on tops although unquestionably based upon strong wool values. There was no marked tendency in the domestic top market but in Bradford the movement was distinctly upward, including an advance of 1d. per lb. in all grades from 46s to 70s.

Interest in the noil market in December was on the increase and contracts were being made for output of these by-products covering the first six months of 1924. It was stated on reliable authority that a six months' contract had been made for the total output of a mill producing good three-eighths noils at 68c. Fine noils were firm and production was falling off.

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Wool Market Dominated by Lessened World Clips

Heavy Early American Buying in 1923 Followed Later by Extensive Re-Exports—Domestic Wools Decline from May to November Then Recover—Foreign Wools Creep Upward Rising Rapidly at Opening of Seasons—Combing Wool Customs Decision

THE year 1923 was one of cross-currents in wool, domestic wools in general tending downward, foreign wools moving upward; a larger general consumption of crossbreds in the United States and Great Britain; France and Japan strong on merinos, and a growing realization at the close of the year that with anything like a normal world manufacturing demand for wool a shortage of approximately 300,000,000 pounds was imminent.

Among the domestic features of the year may be mentioned the ruling of the U. S. Customs Court that combing wools under the provisions of Paragraph 18 of the Emergency Tariff Bill of June, 1921, were duty-free, that "wool commonly known as clothing wool" did not include combing wool; and large re-exports of wool from Boston, approximately 6% of its total imports. Manufacturers' stocks of wool as of September 30 showed for the first time in many months smaller holdings than the combined stocks held by dealers and pools, the slump in manufacturing stocks of grease wools being 29% in 12 months.

The feature of the year in foreign and primary markets was a slowly upward trend culminating in a burst of energy in the South American markets at the opening of the new season, lifting wools by the beginning of 1924 20-25%, much higher prices for merinos in Australia and better prices for crossbreds in New Zealand. The confident buying at the back of this rise could be attributed only in small part to the United States and Great Britain, although it became evident as the year 1924 opened that American manufacturers were becoming somewhat apprehensive and were prepared to buy the fine wools they needed in Australia at prices forced upon them by foreign competition. In the Buenos Aires market the rise in Lincolns was quite violent, these wools being quoted in January at 27c., a rise of at least 25% from the opening of the season.

In the domestic wool market the year 1923 opened with great enthusiasm and for three or four months business was very good; there was extensive buying in foreign markets and manufacturers and dealers competed for the early western wools at practically the highest prices for the year. This activity in the first quarter of the year was followed by a depression of six months or more after which, under the influence of rapidly rising foreign markets, domestic wools closed the year in process of recovery ending approximately at the January level.

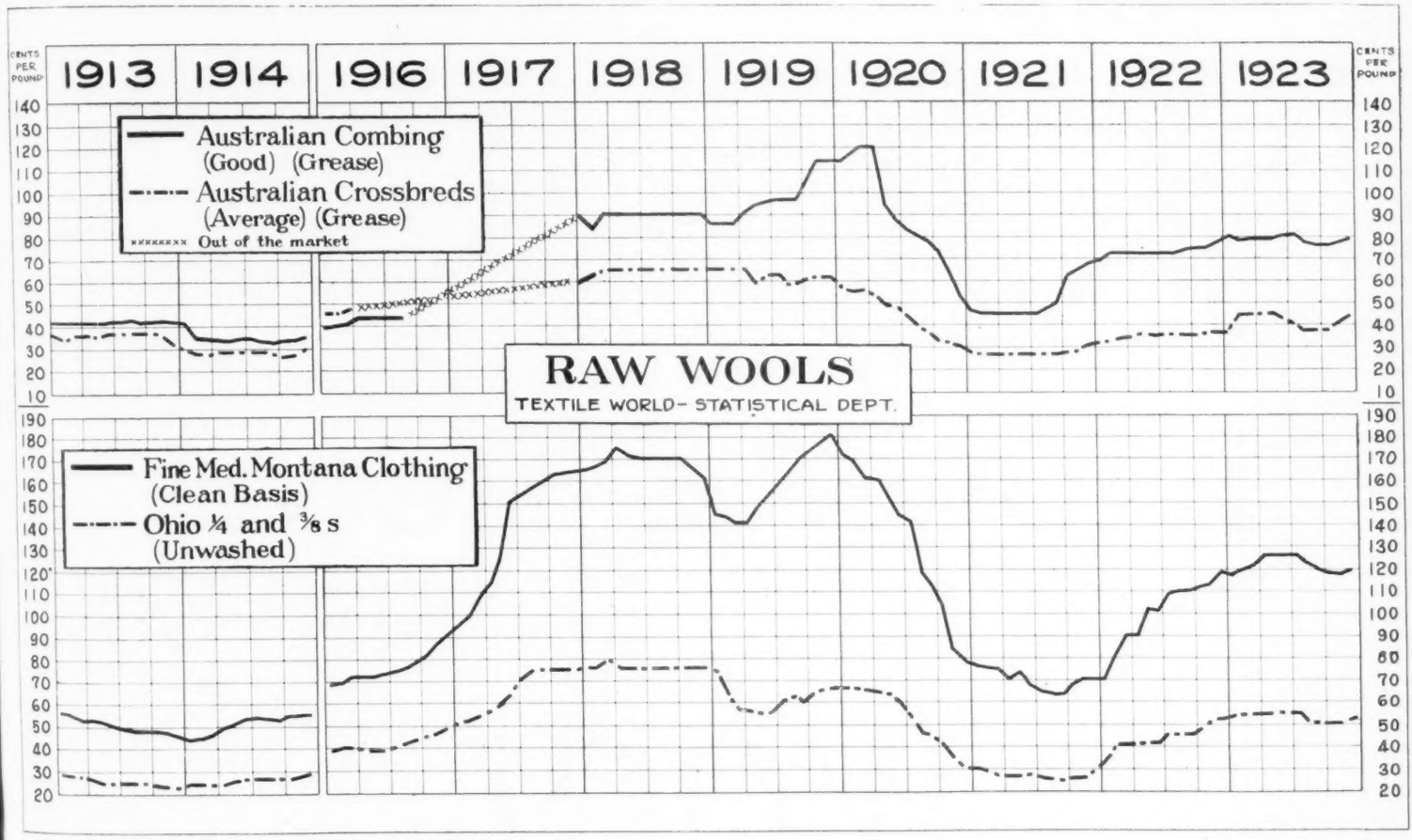
The year 1924 opened with the wool market quiet and confident, the wool trade inventory showing stocks 14.5% lower than for the preceding year. The opening of the goods market, deferred until the end of the month owing in part to depressed sentiment arising from unseasonable weather which had led to a very poor retailing business, was awaited with some apprehension by dealers. Although wools held were still cheaper than in foreign markets manufacturers were to a large extent out of the market. There could not, however, be found anywhere persons who believed that there would be any cheap wools available for many months to come.

Little Cheap Wool at Start of Year

The wool market in January, 1923 was steady with an upward tendency. The trade very generally looked for a continuance of the trend making for a larger consumption of medium wool. This had been very evident month by month during 1922, and was likely to be a feature of 1923. The parity between fine and medium wools has been so disturbed by the war and its aftermath as to make it difficult to believe that delaine wool in 1913 sold below quarter-blood and three-eighths blood in the grease.

The year 1922 was marked by two important events in the wool trade, the first of these being the ending of Government wool control and the second, the passage of the Tariff placing the highest duty ever seen on wools, and based on a new principle. The wool trade had now to adapt itself to the situation forced upon it by the new tariff which could not fail to keep wools at a high level over a considerable period. Little relief could be expected from imports inasmuch as the world production of wool had fallen away very considerably and world consumption of wool was, with the exception of Russia perhaps, returning to normal.

Dealers were making deliveries on old contracts and here and there selling a little wool to belated buyers who found, sometimes to their as-



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tonishment, that there was not any cheap wool available. Foreign markets were high with growers feeling very confident that dealers would have to pay stiff prices for domestic wools. "The street" as a whole did not desire higher prices. It would have been quite content with a stable market around the prevailing level; but if importable wools continued to rise there was not the slightest likelihood of the domestic grower selling his wools on a low level to accommodate wool merchants. High prices made at Sydney had led to a marking up of similar foreign wools in bond. That the Boston market should remain stationary while foreign markets were rising had been somewhat of a problem; but it was explained in part by the suggestion that some of the wools in bond could be sold at a profit lower than "street" quotations for domestic wools of similar grade.

The long-expected Government wool stock report showing condition of raw materials in the industry as of Dec. 31, 1922, made very clear that whatever the character of the fluctuations between wools of different origin, there was always approximately 500,000,000 pounds of wool in the country, or approximately eight months supply. Total stocks held Dec. 31 showed a decrease of 1.8% falling from 525,543,000 lbs. Sept. 30 to 515,543,000 lbs. in December. The feature of the report was the big loss in domestic wool holdings by the wool dealers and wool pools. On Sept. 30, 1922, total domestic wool holdings were 103,497,000 lbs.; Dec. 31, total holdings were 54,863,000 lbs., or a decline of 47% over the period.

Contracting in February

Contracting on a moderate scale was starting up in February. The "street" was in a difficult position; it wanted wool badly but did not want to pay high prices. The domestic growers had the whip hand. A year ago sealed bids were opened for the Jericho clip. In April, 1922, this clip was sold for 40c. but the previous year it sold at 16⅞c. and in the year before that at 71c. Prices ranging from 50 to 60c. were mentioned by producers in connection with the 1923 clip. At 60c. this would mean $1.75 clean landed in Boston. The choicest wools in the world were procurable at the time, duty paid, at from 20 to 25c below this figure. It seemed not unlikely that domestic growers might miss their market unless they were willing to take a conservative view of the situation.

The Strong World Situation

Sir Arthur Goldfinch, the head of Bawra, pointed out that wool consumption was exceeding wool production and predicted a shortage of wool covering several years. "The great and growing strength of the wool market" said Sir Arthur, "at present cannot be impaired." The world would be short in 1923 approximately 600,000 bales. Department of Commerce estimated that world production of wool for the important wool growing countries for the year, 1922, showed a decrease of 10.8% as compared with a pre-war annual average, the figures being: 1922, 2,272,737,000 lbs., as compared with the pre-war average of 2,545,565,000 lbs. Other wool growing countries decreased in production 33% from 616,470,000 lbs., to 413,416,000 lbs. in 1922. The world drift of things is in the direction of a larger consumption of wool; not that cotton is being displaced, but that the progress of civilization is making for greater conveniences as well as luxuries in clothing. Japan for example had been an insistent buyer of good wools in Australia. For the 10 months of 1922, as compared with similar periods in 1921, Japanese wool imports increased 58%; woolen and worsted yarns 365%; textile fabrics 75%. These percentages are based on values, not poundage. During the first half of the Australian 1922 season, Japan bought quite freely, taking fourth place in the list of buyers, the United Kingdom coming first and the United States at the bottom of the list.

Hesitant About Contracting

Dealers in March were still in a hesitant mood regarding contracting in the West. The situation as developed in the various foreign markets during the month had signally failed to provide a new impulse. Weakness in London did not materialize. Wools of American style in some cases sold at par with January level and in other cases above it. The situation seemed generally strong although here and there were merchants who took an opposite view; but the consensus of opinion was that while a higher wool level might not be reached the current level would be maintained for some time to come. The wool trade was somewhat confused at the various factors playing in and around the market. Manufacturers were sitting quiet and watching the situation develop and, being well supplied with wool, were not on the uneasy seat occupied by clothiers. The predicted weakness in foreign markets had not materialized and there was very little wool purchasable in the primary markets that could be landed duty paid under Boston level. A slow and careful contracting season seemed ahead for dealers. Climatic conditions through the country were not favorable to any early shearing. No increase in the general size of the clip was considered likely. Both clothiers and manufacturers were out of sympathy with any further advance in prices. Not for a number of years had Boston been so short of domestic wools. And yet in spite of this the market was a trifle easier. Even fine delaine was obtainable at lower prices.

The Jericho clip of approximately 800,000 lbs. of the best wool produced in Utah was sold to Hallowell, Jones & Donald, who for a number of years had usually handled this clip. The price paid was 51c., as compared with 40c. the year before, and this not only demonstrated the soundness of the situation in wools but gave a strong thrust to hesitating wool houses and led them to commence contracting in earnest. The wool trade, however, was not committed fully to the thought of higher prices for western wools. There was a conservative drag on the market arising in part from houses who had no domestic wool, and in larger part, perhaps, from the feeling that clothiers might not merely fail to respond to, but might actively oppose, the high prices for fabrics that seemed inevitable.

American Increases Wages

Decision of the American Woolen Co. to increase wages by 12½%, effective April 20 for all its mill employes, removed a certain ground of uneasiness as there were to be found here and there on "the street" men who took a rather bearish view of the situation, expecting labor troubles in the woolen industry. A number of independent mills announced similar advances and it seemed likely that the entire industry would be lifted to a higher wage level by the action of the American Woolen Co.

Cancellations were reported both in spring and fall goods and some jobbers overloaded with stocks were selling at lower prices moderate quantities of lightweight fabrics. The movement was considered of little importance and brought about in part by the late spring. Manufacture of overcoatings continued at a great rate based initially upon limited stocks. There was a possibility that manufacturers of these fabrics were now going to the other extreme. Good judges of the market considered the wool situation as very sound and stated that the buying power of the public was better than at the time of high prices in 1920.

Earlier in the year the street very generally expected that the foreign markets would be unable to maintain themselves on the high level they had previously reached. What happened, however, was a surprise; there was a gradual upward climb and prices paid in London, particularly on fine wools, compelled Summer St., to conclude that the prediction of a merino shortage was something more than a dream. It was believed that mill demand for fine wools in the U. S. would be sustained. Continued demand on the part of the public for fine wool fabrics depended upon continuance of general business prosperity with wages maintained at present high level.

The general wool situation seemed nevertheless to be developing uneasiness, owing to the long period of inaction that the market had witnessed. For reasons best known to themselves, manufacturing interests had been only spotty and irregular buyers and in small volume for several weeks. That the mills were consuming large quantities of wool was guaranteed by Government reports which showed for the first four months of the year a very large increase as compared with similar period in 1922. The most likely supposition was that a large percentage of the imports for the year had been made for manufacturing account, and it was also well known that direct mill buying in the West had been quite extensive this year.

Mid-Year Situation

The mid-year wool situation statistically was altogether different from what it had been a year before. This year had been featured by a tremendous increase in imports on the one hand and by marked decrease in receipts of domestic wool on the other. For the first six months of the year Boston imports were approximately 248,000,000 lbs. as compared with 117,000,000 lbs. for the first six months of 1922, an increase of 110%. In the case of domestic wool, conditions were reversed, and as against receipts of 98,000,000 lbs. for first six months of 1922 the trade received for the first half of 1923 only 64,000,000 lbs., a decrease of approximately 35%.

July was a month marked by moderate declines in wool and its semi-manufactured products. Fabric prices alone advanced. There was nothing remarkable in this inverse movement as it was well known that goods had been selling well below the level of wool, tops and yarns. It looked as though the new season might eventually be quite active; President Wood of the American Woolen Company had expressed himself to that effect and further stated that his company was operating more machinery than ever before in its history, that cancellations had been negligible and that they could sell all the goods they could make until the next opening. Dealers were uncertain as to net results likely to accrue to wool markets from the lightweight opening. There had, however, been much less opposition to higher fabric prices than was at one time considered likely.

Another Small Clip

Government report estimated the 1923 clip at 228,031,000 lbs., as compared with the 1922 clip of 220,155,000 lbs., and the latter the smallest clip for ten years. High production point during the last ten years was made in 1912 when shorn wool totalled 304,543,000 lbs. The average clip for the United States for the last ten years is approximately 250,000,000 lbs. It is quite evident that the trend is downward in wool production in this country and that for some time the total production is hardly likely to be more than one-third the actual amount of wool consumed by our manufacturers.

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clip in 1923 was estimated at 19,700,000 lbs. Wool consumption for June showed a decrease of 11.7% as compared with May. Of the wool consumed 69.7% was foreign. For the first six months of 1923 average monthly wool consumption for concerns reporting was 58,477,000 lbs., which, if activities continued on this basis for the balance of the year, would give a total of 677,683,000 lbs. not including consumption by the American Woolen Co.

Poor Light-Weight Opening

There was a general slowing down in the production of men's wear fabrics during the summer; orders for spring goods were insufficient to keep machinery going as fall orders began to tail out. The wool spindles of the country were now running at approximately 85% production. Wool consumption in July was off 27% as compared with peak consumption in January. The entire month of August was disappointing from the merchandising standpoint. The spring opening failed entirely to bring in the expected and much desired mill purchasing of wool. In absence of buying, prices throughout the month sagged to a lower level with distress sales occurring, though not in very large volume. The larger wool houses maintained a moderately bullish attitude. August over a considerable period is proverbially a dull month although it occasionally happens, as was the case in 1922, that mill buyers show a rather unexpected snap and vim. As compared with July general business conditions throughout the country showed a slight change for the better; the recent depression was now considered to have been more psychological than economic.

September found the wool market still two-sided as to sentiment. Some merchants were bullish for the long pull; others bearish for the long pull. Topmakers reported an increased demand for tops grading from quarterblood down, most of them going into knitting yarns. The new costume for women for fall, a knitted skirt and coat, was consuming considerable quantities of quarterblood wool. Fairly large quantities of wools for woolen manufacturing were purchased particularly B. Supers. Worsted wools had been quiet and until the manufacture of men's wear fabrics gained a little more momentum such a condition of affairs was likely to continue. Mills were not out of the market because wools were 2 or 3c. a lb. too high. Wool costs constituted one factor only. There were other factors, such as high wages, efficiency below normal, shorter hours, high distributing costs and possibly above-normal retailers' stocks.

Bullish and Bearish Sentiment

Those dealers who took the view that the wool trend was downward employed the following arguments to support their position: (1) Dealers and mills overloaded; (2) woolen manufacturing declining rapidly, even the American Woolen Co. only having enough orders to keep its mills running four months; (3) wools held so long by dealers that there was a continuous bank pressure to force partial liquidation; (4) manufacturers had plenty of wool to cover their prospective needs; (5) the public would not pay the high prices made necessary by high wool and labor costs. On the bull side it was said: (1) Weak spots had all been eliminated and wool holdings were in strong hands; (2) sufficient mill buying being encountered to lift prices for wools in demand; (3) foreign markets so strong that manufacturers could not buy to advantage anywhere but in American markets; (4) manufacturers short of wool and must do more buying to keep their mills going; (5) low level for wools had discounted the depression in manufacturing which was changing for the better in the lead of the woolen branch of the industry.

Mohair Prices Sustained

The mohair section of the market was stronger with some increase in activity. In the Bradford market standard mohairs had been on the same level for three months. Turkey fair average was quoted 18 pence and in bond here 35-40c.; Cape firsts in Bradford 18 pence, in Boston 35-40c.; Basutos 17½c. pence, in bond Boston 35-40c. Re-exports of Turkish mohair totalled 470 bales or 97,817 lbs. Turkey fair average had been quoted in the Bradford market for three months at around 18 pence. Turkish hair is quoted in bond here 35-40c. but as the duty is 31c. clean content there is little inducement to take such hair out of bond on diminished manufacturing demand for mohair. Buying of Texas fall hair went on steadily with the possibility that growers might lift prices.

The Upward Turn in December

The wool market at the beginning of December was a little less active but prices held firm. Topmakers in search of additional supplies reported difficulty in obtaining wools grading from 50s to 70s except at higher prices. The top market was not over busy these days, its new business coming almost exclusively from knitting interests. Spinners who had to buy tops in the open market were unable to compete successfully for the limited amount of new business in worsted fabrics available when confronted by offerings of manufacturers who combed their own wools and spun their own yarns. The tendency in the wool trade was toward a more normal condition which meant for holders of wool the obtaining of better prices for wools purchased by manufacturers. A substantially higher level was regarded as not improbable.

As the year drew to a close it looked as though the total amount of wool brought into Boston, foreign and domestic, would be slightly smaller than during the year 1922. Domestic wools were approximately at the same level as at the opening of the year; but during the summer and fall much lower prices had obtained. The London sales closed December 20 with all grades strong and advances ranging 5-20% as compared with November closing. "Bawra" wool stocks which at one time seemed an insurmountable obstacle in the way of fair prices to wool growers throughout the world had melted away and the world's wool markets relieved of this incubus showed quicker re-action to the real needs of wool-consuming countries.

Substitutes Experience Good Year

Better Call for Light High-Grade Stocks—Worsted Wastes Tend Higher—Serge and Worsted Rags Improve

THE recovered wool industry did fairly well during 1923; the wastes and by-products of wool also had good business; but the woolen rag market throughout the year labored under very unsatisfactory conditions caused in part by large imports of the better class of rags on the one hand and by an irregular and much-below-normal demand for dark colored standard domestic rags on the other. At the close of the year the rag situation cleared somewhat owing to improved demand for standard serges and worsteds and by a distinct falling away in imports.

Prospects facing the reworked wool industry seem better than they were a year ago. At that time wool manufacturing was in full blast and everything seemed to be moving forward to higher levels and increased activity. Opening prices at the heavy-weight season were quite satisfactory and there was no question raised as to the attitude of the public regarding higher prices. Since then a change has come over wool manufacturing and distributing, so much so that it is felt in some quarters that if the 1924 fall fabrics open at higher prices the season may be somewhat of a failure. And yet wools are as high as they were a year ago and the same is approximately true of noils and wastes. In such a situation, and in view of a possible limited amount of wool available during the course of the year, recovered fibres, many of them of great value and at least equal to virgin materials and on a low level showing little if any appreciation during the year, ought to find much larger favor with manufacturers, leading to greatly increased consumption.

Looking over the course of recovered materials during the year 1923 it seems as though it ended much better for carded serges and worsted than it began. At the beginning of 1923 the demand for knit stocks and merinos was very good and as a matter of fact was maintained throughout the year; but serges and worsteds were quite neglected until near the end of the year.

Price Comparisons

The following comparison shows that while knit stocks and merinos ended the year on a slightly lower level serges and worsteds closed at an advance. The composite figures which follow are obtained by aggregating prices of the standard materials in each classification:

	January	December	Change %
Serges	125	135	+ 8
Knits	113	108	— 4
Merinos	79	75	— 5
Worsteds	68	80	+17

Comparing prices of standard mill wastes with those obtaining at the beginning of 1923 it is evident that the general average level at close was approximately the same. Some wastes were higher and some lower. Fine colored lap wastes appreciated the most of any material during the year while white worsted card waste ended much lower. The following comparisons will be of interest:

	January	December	Change %
Fine White lap	125-135	130-135	+ 2
Fine colored lap	88-92	105-110	+19
Fine worsted threads ...	85-90	88-93	+ 3
One-quarter bld threads	50-55	47-52	— 9
Fine Card....	55-60	48-52	—13

Recovered wool manufacturers in February 1923, were wondering whether the high price of wool and its by-products would force manufacturers to utilize to a larger degree reworked wools. The encouraging feature in the heavy-weight opening was the larger attention paid to standard overcoatings. The plaid back overcoating, high-priced and stylish, calls for light colored materials capable of being dyed to the right shade and the weaving of the fabric is a much slower operation. A larger return to staple manufacture would be a great advantage to the reworked wool industry. The industry was moving along slowly, but on account of the smaller number of recovered wool plants business seemed perhaps a little better than it really was, looked at from an angle when large numbers of recovered wool plants were in full blast on war materials.

Cloth and Softs

Some imports of knit materials were being made; not by regular rag houses, but by individuals in touch with certain mills who knew where to dispose of the material on its arrival. Traders in the Dewbury market were afflicted by the narrow demand just as our domestic graders; both industries had to place more unwanted materials in stock than was pleasant. Fluctuations in the rag market, especially those relating to the speculative buying and selling of cloth and softs, covered such a narrow range as to furnish evidence that these basic materials had discounted everything that could

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happen to the reworked wool industry. Cloth seemed to be stabilizing itself around 2c, and softs around 8c. There was some larger purchasing of serges especially of blue serge, acquired for stripping purposes.

Wool wastes were in steady demand. Movement of these commodities was about 50-50 as between mills and traders. A tendency to advance was visible, but had not yet materialized, except, perhaps, in the case of the fine threads which for good qualities ranged up to $1.00. The greater part of the business being done was in medium qualities which showed an upward trend. Fine qualities were in the main stationary.

The recovered wool market looked much better and prospects were more cheering in March than they had been for several months. Demand was still rather narrow in the sense that standard dark colored materials were in limited call only. Knit stocks were leading the industry into a much better position and imported materials were affording our manufacturers choice fibres of high textile value.

The rag situation was growing stronger. The head of a large house in close touch with rags and woolens, recently returned from Europe, stated that the Continent would be an increasingly large buyer of American rags, while this country, on the other hand, would continue to use on a larger scale clips and high grade materials. The graded market was firmer. Cloth was not far from 2c., and the trend was upward. Softs were well established over 8c., and as high as 9c., was paid for softs showing a fair percentage of knitted material. The call for all shades of knits of straight wool was good.

Threads Lead Market

Prices in the wool waste market were quite stiff with fine worsted threads holding the entire market at a high level. High prices had been brought about not only by mill demand operating on moderate supplies but also through speculative operations on the part of traders in wastes. New business was not flowing in rapidly and it was a question whether mill demand in the weeks immediately ahead would be sufficiently extensive and urgent as to maintain the high level necessary to market wastes acquired by traders at a profit. In spite of the fact that colored threads were selling below their intrinsic value movement in them continued disappointing. There was extreme difficulty in obtaining garnetting facilities. White garnetted material was in such good demand that people owning such machines were altogether indisposed to switch off to the garnetting of colored materials. Colored worsted threads were considered to be the cheapest materials in the market at the time.

Most of the cards of the substitute industry were running at full capacity in April. Men from this market who had been traveling in Maine among the woolen mills said that the demand ran less to rags than to carded material all ready for immediate batching and passage through the machinery.

Rags were rather softer. Concessions were available in several of the graded qualities while cloth and softs moved downward fractions of a cent. There was nothing significant about these fluctuations and the market was just as likely to turn upward as to remain where it was.

In wool wastes there was a rather active market between traders but mill demand was slow and the general trend showed no upward tendency. White and colored laps were in good demand. These materials were scarce, nor could any relief be obtained from imports owing to high prices in the Bradford markets.

The demand for fine white garnets had fallen away and prices were lower. At the peak of the movement they were quoted $1.10-15; ruling quotation was now $1.00-05. Medium garnets were in better demand. Machiners well supplied with orders on white threads were rarely disposed to take in colored materials owing to the difficulty in small plants of keeping the two classes absolutely apart.

Discouraged Rag Market

Recovered wool manufacturers were not getting much new business in May and as they were fairly well supplied with rags and materials they were not giving much support to a rag market which sorely stood in need of encouragement. Some rag graders were openly bearish on the situation. The long-continued neglect of standard and dark-colored materials had worn their nerves to a frazzle and in such a mood it was not to be wondered that they were ready to turn over their somewhat large stocks to any one with cash and courage enough to make the purchase.

June Market Lifeless

The re-worked wool market was lifeless in June. New business being placed was entirely insufficient to balance the deliveries taking place on old contracts. The industry itself was in a rather irregular condition, one or two mills being very busy while others were nervous over the small amount of incoming business. The rag market continued dull but it was felt to be impossible for cloth and softs to fall much lower. Rough cloth was barely firm at 1½-1¾c., and mixed softs were wobbly at 6¾ to 7¼c. Fairly good prices were paid by mills and manufacturers for light hoods and knits, fine light merino, white softs, paper mill felts and similar materials; but the volume of throwouts resulting from this highly specialized selective process was formidable.

The heavy-weight season was running rapidly to its close and according to precedent the light-weight season should not make any very heavy demand for recovered material. But in recent years the two seasons have interlapped and the phrases "light-weight" and "heavy-weight" mean less than they did several years ago; the tendency has been away from real heavy-weight clothing to an average lighter fabric for the entire year round. It was mid-year contracting time in the waste market. Mills had good-sized accumulations not contracted for and anticipated the continuance of good business for the remainder of the year, which in this connection meant steady production of the by-products and waste materials incident to woolen and worsted manufacture.

Dark Rags Accumulating

The rag market continued quiet in July and unsettled with prices favoring buyers, even on such relatively active lines as fine light merinos, light knits and white softs; cash offers for the latter stimulated price concessions of 1 to 2c., and on dark stocks in merinos and worsteds the weakness was even more pronounced; however, this was a condition that had existed for a long period and represented no new tendency. In fact unsettledness seemed likely to continue until graders and manufacturers commenced to operate in anticipation of the next heavy-weight season. Stocks of rough cloth and of dark worsteds and merinos continued to accumulate, prices in the buyer's favor; prices that the paper stock and roofing trades were willing to pay for strippings were so low that it was hardly profitable to skirt such rags. Except for a moderate demand for light stocks in fine merinos and knits, there was no development of importance in reworked wools and prices showed no quotable change.

There did not seem to be anything of any particular interest brewing in August, except a tendency, rather than a movement, toward larger interest in dark-colored materials of the finer grades. Fine dark merino was selling at a ridiculously low price and it might have been assumed that some enterprising manufacturer would have found some means of stripping the color from these rags. Fibre for fibre they were just as good as fine light merino. Only their color was against them. What was done constantly in blue serges might perhaps have been done in fine dark merinos if the enterprise were there and the technical knowledge.

Men connected with the graded rag industry making the rounds of mills and reworked wool plants reported an almost complete dearth of interest. Cutting of prices was of no avail. Purchasers would not come into the market for rags unless they had orders on their books, and as business was far from satisfactory, the actual purchasing of graded stocks was near the minimum of the year. Prices for softs and cloth were firm but graded materials in spite of relative scarcity were sagging in price from sheer neglect in mill purchasing.

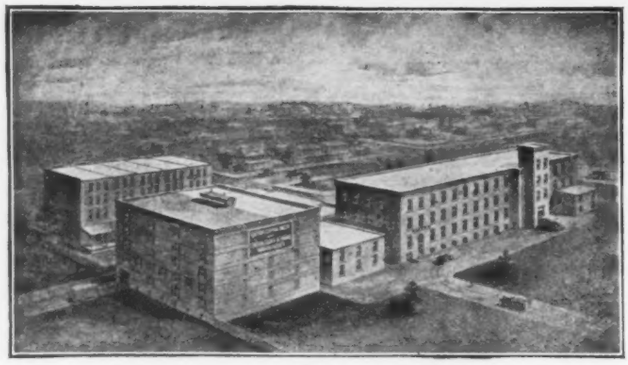
In the English industry conditions were similar. The supply of rags there was said to be less than usual owing to dealers holding back supplies up country until mill demand was better. All kinds of rags were softer in price, even the best stockings and other knit stocks, which up to this time had been in good demand for export to America.

Substitutes An Economic Necessity

The recovered wool market during October was not altogether satisfactory, but that was true also of other textile markets and it was quite likely that this market and industry were doing relatively as well as the parent wool market and industry. Approximately 5 lbs. of scoured wool are used in this country to every pound of recovered material. This places the recovered wool industry in its rightful position and demonstrates clearly that it is no small affair dealing with non-essential fibres that some change in the manufacturing situation may throw to the discard. A leading recovered wool manufacturer, interviewed regarding the prospects of the industry for the balance of the year stated that woolen manufacturers generally could not get away from the economic necessity of using wastes and substitutes for high-priced wools. Legislation or no legislation, and whatever the character of the tariff in operation, recovered materials were going to be used at some price and in some way or other. Rag graders still complained of lack of business. Consuming demand was confined to light-colored materials embracing merinos and knits. Rough cloth was getting more of a problem every day. Collectors were said to be removing the old coats and vests, for which a much better price was obtainable for shipments to certain parts of Europe.

In wastes, garnetted materials whether white or colored led the market. The ungarnetted materials furnished a standard material for speculation by various trades on the street. Worsted wastes in general were in fair demand, and the choice grades of colored materials were selling with moderate facility. Imports of wastes were limited but attempts were being made to secure desirable threads in the Bradford market.

At the close of the year the general substitute market, covering reworked materials and mill wastes, seemed to be headed the right way and it looked as though the general situation were shaping up for much better business with higher prices probably for worsted wastes owing to limited mill output of these commodities and a high Bradford market preventing imports. It was not considered likely, however, that any large flood of orders would appear immediately as this market, like other markets catering to wool manufacturing, was awaiting the big event of the fall openings.



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Raw and Manufactured Silk Review

Setbacks Marred Promising Broad Silk Year

Physical Volume of Business Holds Up Well Compared With Preceding Year—Invisible Stocks Not Thought to be Large—Japanese Earthquake Killed Fall Season—Overproduction of Prints a Serious Factor Last Spring Continuing as Influence During Year

THE year 1923 which opened so auspiciously and with such apparently bright prospects was marred by two severe setbacks which upset the calculations of many manufacturers and which brought severe losses in quite a few instances. The actual physical volume of business for the full year held up well when compared with the preceding one. Deliveries of raw silk to American mills, which may be considered as accurate an estimate as it is possible to obtain of production of silk goods, showed but a negligible decline from the record total of 367,600 bales used in 1922. The consumption in the current year was 358,000 a figure far in excess of even the boom year 1919. The extraordinary activity of the first four months though, helped materially to swell the total for the full year.

Of the two serious depressions periods experienced during the year the first which resulted from the overproduction of prints in the spring could have been foreseen and provided for. The second came on the heels of the Japanese disaster and was outside of the calculations of all save those gifted with some uncanny power of divination.

The terrific earthquake in Japan which wiped out two of the largest cities in that unfortunate country and did untold damage to a large area, cannot be considered as unfavorable to business in general in this country. For the silk industry, however, it created a situation which had no precedent. Practically three quarters of the silk feeding the looms in this country comes from Japan, and Yokohama—whence it is shipped—lay a mass of ruins. The total stocks in Yokohama, known to amount to at least 35,000 bales, were reported as destroyed. Confused by the vast amount of information and misinformation extant at that time, it is small wonder that the silk manufacturer knew not where to turn or what to do. Due to the cautious buying policy of the three months preceding, few had adequate supplies of raw silk on hand. Should he simply use up the current supplies of raw and thrown silk on hand, sell out his stock and suspend production or should he buy more raw material at the high prices and trust that speculation would carry them still higher? Each and every one was faced with almost the same problem. What happened is now history and the correct solution seems so simple. But it it was not so easy then despite the fact that the expected profits due to higher prices soon vanished into thin air.

Year Opened Well

The year opened very auspiciously. The fall season of 1922 had been just about the most satisfactory period the trade had seen since 1919. Confidence was expressed in every quarter and moreover these optimistic views were actually held and acted on. They were not the thin vaporings of those who sing cheerily in the dark to keep up their courage. Advance buying of spring merchandise had been such as to bring the trade to the belief that even better things were in store. Raw silk at the time was at about the highest point it had been in several years and this was the only real cloud on the horizon for it was felt that if production was expanded any further even higher levels were likely.

During the months of January and February spring buying developed very satisfactorily. Under the stimulus of heavy forward purchases raw silk advanced above $9.00 a pound. Fabric prices were advanced commensurately, to the satisfaction of those with stocks of goods on hand. The staple crepes, satin Canton, Canton, crepe-de-Chine, and flat crepe were all moving easily. Taffeta enjoyed its usual seasonal spurt of activity and the novelty silks were sold up to the full extent of the possible production. Prints which were well liked during the fall began to come into greater prominence.

In the latter part of the spring prints were being seized with avidity by the cutters and the retailers. The excavations in Egypt of the tomb of an ancient ruler was being prominently played up in the press about that time. With all this free publicity certain manufacturers hit upon the happy thought of bringing out some Egyptian prints. Encouraged by the extravagant predictions that the fashion trend would veer entirely to the Egyptian and noting the already good demand for prints, manufacturers rushed through the famous "King Tut" designs. Many who dealt entirely in the plain materials followed suit. The result was the inevitable overproduction.

Those who got their first pieces from the finishers found a ready market but when it began to be bruited about that thousands of pieces lay at the dyers and finishers who were unable to cope with the unprecedented volume offered them, a suspicion of what was to come impressed itself on the minds of a number of farsighted producers. These moved their stocks at concessions but when the majority got their stuff through they found the market practically non-existent.

Then ensued a period of price cutting which affected not only the chief cause of the trouble, the variegated Egyptian patterns, but the staples as well. Mills curtailed production and stopped buying raw silk. The raw market likewise began to decline from its high point of $10 a pound which did not make matters any better. The months of May, June and July were rather poor ones. This was despite the fact that retail trade throughout the country was holding up well and that the Egyptian designs were moved over the counter at special sales without much difficulty.

Starting in August improvement began to be noted. The raw market by this time had hit a low of $7.00 a pound for Kansai No. 1 which encouraged manufacturers to start up operations again for indications for the fall season were favorable. During August raw silk rallied to above $7.60 for Kansai, evidencing a return of confidence and an increasing mill output. Then occurred the unexpected which was to transform a market giving evidence of steady improvement into a chaotic muddle.

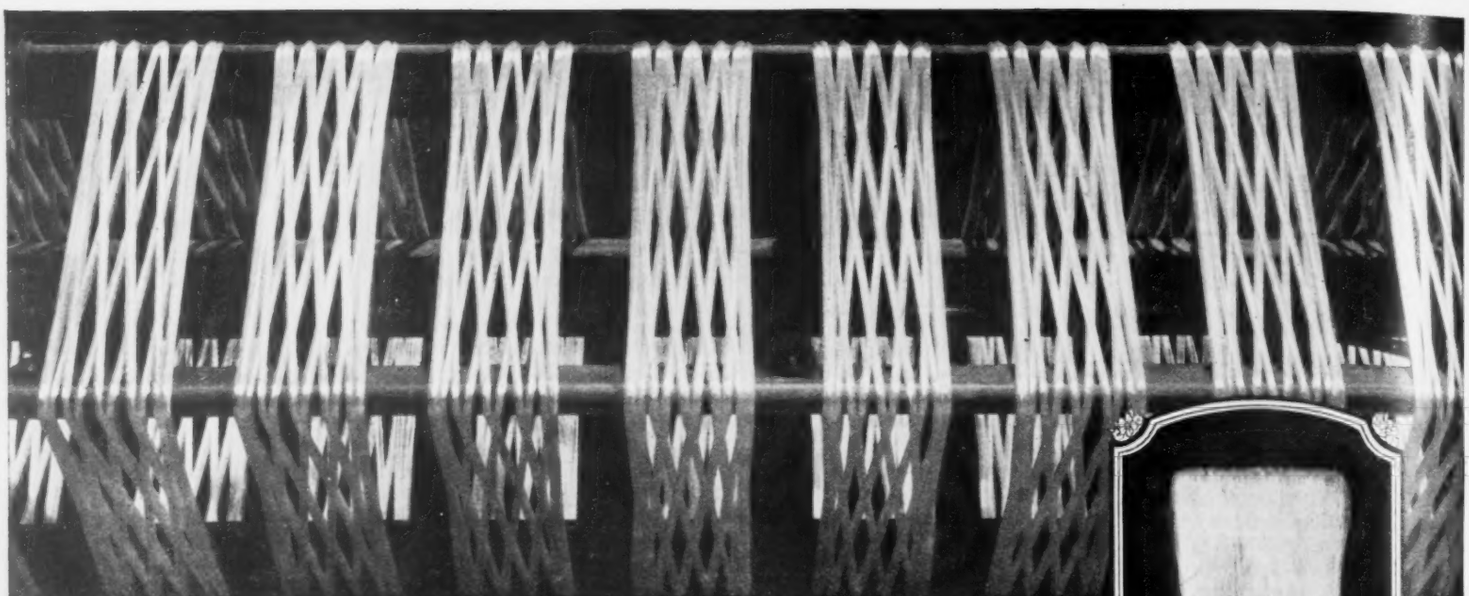
The Japanese Disaster

When the trade reopened its doors on the Tuesday following Labor Day it had the shocking news of the Japanese disaster to reckon with. On the same day sales of raw silk were reported at $10.00 a pound, an advance overnight of $2.00. It has already been pointed out that manufacturers at the time had scanty supplies of raw material. What to do was the question. The only possible move under the circumstances was to suspend all trading in raw silk and to withdraw prices on fall lines and this was done with the hope that more definite information would be available in a few days. Later news confirmed and amplified the details of the first horrors and the destruction of the 35,000 bales held in Yokohama was confirmed. Despite the official decree that all trading in raw silk should be suspended, sales were made in New York at steadily advancing prices. The foreign markets in Canton, Shanghai, and Milan also advanced sensationally.

The month of September was a trying interval. Within a few weeks after the disaster, most fabric lines had been reopened at advances ranging from 5 to 15% but in the meantime the damage had been done. The cutting up trades, which were just getting into their active fall season business in September, had discarded their silk lines and turned to woolens and like fabrics where prices were on a saner foundation. Silk sample lines were sold out at a loss and new lines offered.

Price Slump as Aftermath

As a result silk sales fell off decidedly and when in October by means of superhuman efforts the Japanese rushed through raw silk by every available steamer so as to take advantage of the high prices prevailing, raw silk dropped violently from close to $11.00 to $8.00 in the space of a few weeks time. October and November were both poor months with most mills taking in high priced raw materials and selling at whatever prices could be obtained. Criticisms of the policies adopted in the trying month of September are simply begging the question. No other move was open to a manufacturer who had small supplies of raw silk on hand than to withdraw his quotations. If the speculative profits, which many believed lay in store for the bold operator, disappeared leaving nothing but the memory and a



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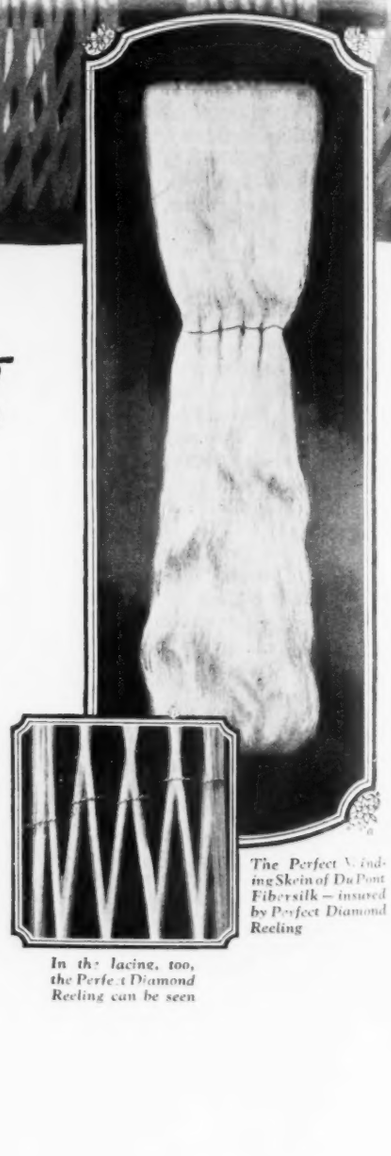

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number of high priced raw contracts to take in, it was simply the fault of fundamental conditions which certainly did not favor speculation at the time. During December there was steady improvement with the promise of a spring season that, if somewhat below last year's impressive showing, will be satisfactory as to volume when compared with previous years.

Outlook for Future

The outlook for 1924 is somewhat mixed but when one searches for weak spots in the armor of the present business and financial situation, it must be admitted that they are difficult to find. This is without considering the European situation which is admittedly bad but which seems to be overestimated as a factor bearing on trade prospects here. Forecasting is difficult and thankless at best with so many unforeseen elements able to throw the most careful and comprehensive estimate out of gear. It is noticeable that prominent business men and bankers are very wary of committing themselves as to the second half of the current year, guardedly expressing the opinion that this period will probably be somewhat less active than the first half.

It seems likely that the silk industry will see operations expand somewhat further during the next few months. The trend has been favorable during December with sales on the increase and stocks of finished goods not unusually large. A very fair spring season—and the spring season is normally the most active—is in prospect. Manufacturers will doubtless prepare themselves conservatively for this. Some reaction is to be expected in the late spring and early summer.

The fall season should be distinctly good. This opinion is ventured without any qualification and with the full knowledge that there are many who believe otherwise. Those who hold the opposite view offer nothing in support of it except the fact that it is a Presidential year. If election issues and results were uncertain possibly this could be offered as a valid reason, but with the Detroit possibility out of the way and strongly in support of the present incumbent of the Presidential office, it has little to support it. Business throughout the country has shown definite signs of recovery from the spring slump. Price indices are advancing. In spite of evidences of renewed expansion, money rates are easier with the possibility of a reduction in the rediscount rate in the spring. Nothing offers the slightest reason to believe that further deflation is ahead of us and it is falling prices that make for poor business. Nor is there any reason to believe that the silk industry will be the exception in the march of progress. To the contrary there is every reason to believe that with living standards on a higher plane, the silk industry will be in the van.

Ribbon Manufacturers Confident

Past Year was Satisfactory with Sales Trend Following that of Broadsilks—Narrows were Most Active

THE past year in ribbons was satisfactory with sales holding up well when compared with 1922. The slackening noted in general business in the late spring and early summer was shared by ribbons but on a somewhat lesser scale. Again in the late fall, the slump in silks following the earthquake was reflected in ribbon sales, but here again was not so serious because of the customary activity preceding the holiday period which could not be deferred. All in all the twelve months' period just closed was distinctly encouraging and manufacturers view the coming spring with optimism.

Last year's spring business was extraordinary as to volume with the milliners, cutters and retail buyers actively in the market. Prices were on a firm basis in view of the steadily rising raw market and the four months' period ending in May can be said to have been the most satisfactory since the break in 1920. Through the late spring and early summer things were quieter. A drop in the raw market incident to the overproduction of prints in the broadsilk field, had its effect on ribbons and buyers were encouraged to hold off despite the fact that retail business was continuing on a record scale.

Lower prices were possible in August and this fact taken in conjunction with the rather depleted condition of retail stocks brought improvement. With the fall season just getting under way, the Japanese earthquake coming in the early part of September seriously disrupted the well ordered situation which was giving promise of steady improvement. Prices were withdrawn to be reopened shortly afterwards on a higher level which seemed necessary in view of the sensational leap upward in the raw market.

In spite of the higher prices, a very good demand was experienced in September. Again in October while the broadsilk market was stagnant, ribbon manufacturers noted active business because of the fact that holiday buying could not be very well deferred with the season so near at hand. The dress trades bought less at this time but this was made up by the increase in sales to retailers. November was likewise a good month at a time when the other silk producers were in the worst of the depression following the earthquake slump. The close of the year was rather quiet with manufacturers concentrating their energies on new offerings for spring.

The past year was educational in that it pointed out some important truths. During the last several years, the wide ribbons have been declining in sales volume due to the fact that two of the fields for these types have been to a certain extent lost. Hair bows and sashes which consumed a large yardage have been for awhile past, passe. In the belief that it would be necessary to bring about a revival of interest in them, to insure satisfactory sales, manufacturers have expended a lot of misdirected energy in efforts in this direction. To a certain extent they were successful with the sashes but as far as the hair-bow is concerned, they have failed.

Made-Up Novelties Active

As a matter of fact, testimony from retailers is that sales of the two articles mentioned above amount to only about 2% of their total sales of ribbons. Viewed in this light they are not nearly so important as is generally supposed. It is unquestionably futile to attempt to stimulate interest in that which is relatively unimportant and dead. To concentrate on the live items would seem the wiser thing and is worth while noting in this connection that made-up novelties have been very active in the stores all through the year. Those stores which have concentrated on developing the things which the woman of today wants have noted largely increased sales in their ribbon departments.

Outlook for 1924

The spring of 1924 promises an active season in ribbons. In Paris hat trimmings have emphasized both the narrow and the wider widths. The five and seven-inch widths are mentioned as particularly well liked and it is possible that the Paris fashion trend in this particular presages increased interest in the medium wide ribbons here in this country. Style forecasts for the spring season here points to the use of ribbons on an extensive scale. Preparations have been made for an increased demand for the wides, particularly the satins, roman stripes and moires. The narrow novelties will also undoubtedly be well liked with many new offerings to attract. It would seem well to mention here that constant change and variation are necessary for the continued popularity of ribbons.

Imports of Raw Silk Declined

Wide and Erratic Fluctuations Marked Movement of Prices—Consumption Continued at High Figure

IMPORTS of raw silk declined during the past year from the high figure of 391,900 bales brought into the country in 1922. Total imports for the year were 350,100 bales. The decline was due in part to the Japanese earthquake which seriously interfered with shipments for a time but there would unquestionably have been a falling off even had there been no earthquake. Consumption during the year held up close to the record total of the previous one, 358,300 bales being delivered to American mills which compares with 367,600 used in 1922. It appears from the figures given above that more silk was used than was brought into the country but this does not take into account the factor of invisible stocks which may or may not alter the foregoing considerably. Supplies held by manufacturers and throwsters it is only possible to estimate, and this holds true with stocks of finished goods held on the shelves of sellers and retailers.

Stocks in Yokohama amounted to 37,000 bales on Jan. 1, 1923 and stocks in New York warehouses to 49,100 bales. During the fall of 1922, encouraged by the demand experienced and anticipating an unusually good spring season, importers began to build up reserves in this country which accounts for the large quantity held in warehouses. How correct they were in their judgment is well evidenced by the heavy deliveries to mills during the months of the spring. In the first four months of the year consumption amounted to over 142,000 bales or at the rate of 420,000 bales a year. With supplies in Japan relatively small and demand at such an unprecedentedly high figures, it is small wonder that the market advanced without much difficulty.

Advance at Start

The year opened with a sharp advance of 80 Yen which brought XXA to 2220 Yen or the equivalent of about $8.70. This price was rather high, in fact about the highest point raw silk had sold since 1920. It was high enough to make manufacturers dubious about operating on a heavy scale and as a result during the balance of the month of January, buying was light but importers held firm to their prices. In February, however, a steadily increasing spring business and finished goods brought renewed activity. Prices moved up easily in the foreign markets, XXA at the beginning of March being quoted at 2390 Yen or about $9.40. These prices were maintained firmly during the first part of March but in the second half strong resistance on the part of buyers combined with increasing arrivals brought a decline to $9.15 for the XXA grades.

In April increasingly good business in finished silks brought renewed buying into the market. Forgetting the dangerously high level of prices, manufacturers in many instances covered themselves for a month or two ahead. Shortage talk was heard as is always the case when prices are too high. Raw

TUBIZE

ARTIFICIAL SILK COMPANY OF AMERICA

The production of artificial silk in fine denims as developed by us marks the greatest advance ever made in the industry.

Sales Office

303 Fifth Ave., New York

HOPEWELL, VA. PHILADELPHIA, PA.

quotations moved higher and higher until XXA touched $9.90 a pound with $10.00 paid in some cases for special cracks. At this point, in view of the increasing difficulty which manufacturers were having in getting replacement costs out of their merchandise, caution began to dominate and demand fell off.

At this time some importers desirous of disposing of the balance of their old season silk began to make offers below established levels but found little response. An overproduction of prints made its appearance and a tighter money market tempered some of the spirit of optimism so noticeable such a short time before.

Contraction in Summer

During the months of May, June, and July a sharp contraction in business and a falling off in production were very apparent. Imports dropped off to an average of 25,000 bales a month for the period and consumption at the same time averaged only about 27,000 bales which latter compares with an average of above 35,000 bales a month during the spring and a high point of 38,200 bales during May. In view of the reduced demand it is not surprising that prices melted away swiftly once the decline got under way. Old season silk which had sold but a month before at close to $10 a lb. was quoted at the end of the season at $8.30.

As the new season opened visible stocks in the various producing centers and in New York were as follows:

Yokohama	17,000 bales
Canton	5,000 bales
Shanghai	500 bales
New York	25,800 bales

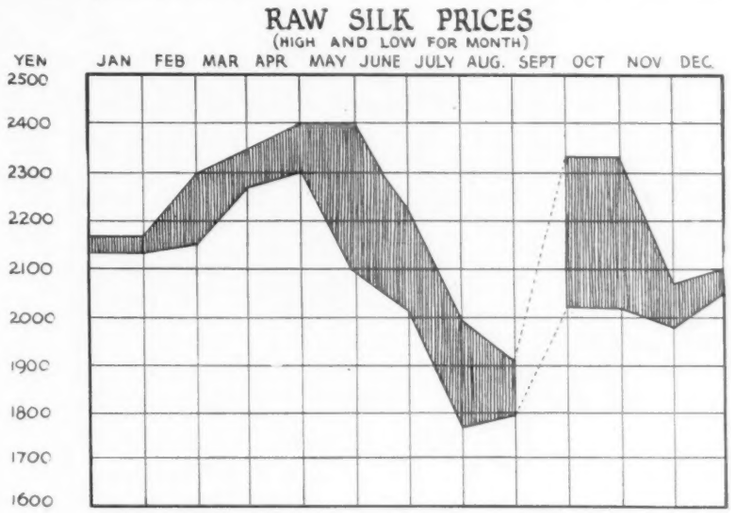
It will be seen that stocks were very much reduced both in Yokohama and New York from the totals of January 1, from which time the market had advanced almost without reaction all during the spring. Despite the fact that stocks were smaller there was the general feeling that prices would work somewhat lower in view of the reported increase in the various crops. The spring crop in Japan was reported as 7% larger than last year, the first four crops in Canton about 16,000 bales larger, and the Shanghai crop about 15% larger. With business still subnormal in this country lower levels were waited for by buyers before starting operations.

A fairly active inquiry on the part of exporters in July merely served to maintain prices and when this support was withdrawn there was a bad break in the latter part of the month. By August 1, stocks in Japan had increased to 32,000 bales and prices had declined to 1780 Yen for Kansai No. 1. Reelers who had paid high prices for cocoons in the early part of the season were faced with serious losses at this time and a movement was started to peg prices at these levels. However, an improvement in the American demand made this unnecessary and during the balance of the month of August a good inquiry started prices upward again. By the close XXA had gained about 50c a lb., and was back in the neighborhood of $8.

Earthquake Period

So much has been written about the earthquake period that it will be unnecessary to dwell upon it in detail. Suffice to say that the market in Yokohama suddenly ceased to exist and the other markets were plunged into the wildest confusion. Prices rose by leaps and bounds, close to $12 a lb. being paid for Italian and Shanghai silks with Canton above $10 a lb. In the New York market, prices opened at $10 and after a short period of hesitation soared above $11. Practically all the silk in Yokohama amounting to 35,000 bales was destroyed with the exception of certain quantities held in concrete go-downs by a few importers. There was the general expectation that it would be very difficult to resume shipments on any sizable scale before October.

Overcoming almost superhuman difficulties, exporters in Yokohama managed to get some silk through from the interior and on September 22 trading was resumed again in a small temporary structure with ruin and desolation on all sides. In the face of the almost insurmountable obstacles, it seemed an impossible task to get silk through in any volume in October, yet it was done. Shipments from the interior were small so that prices in the temporary market advanced without difficulty during the latter days of September and the first part of October. The top prices paid for Kansai at this time was 2340 yen. The difficulties which the fabric markets in this country experienced have already been touched upon elsewhere and it will be enough to say that the impossibly high prices soon acted as their own corrective with a distinct lessening in interest on the part of buyers. The second half of October saw a sharp break which brought prices by the early part of November to close to $8.00.



Demand during November was spotty and prices weak with the result that reelers made preparations to form one of their well known combinations to peg prices. A revival of demand in December, however, made this unnecessary and prices as the year closed were much firmer in Yokohama. A disturbing element made its appearance about this time, however, in the shape of a break in yen exchange which has permitted lower dollar prices up to the end of the year 1923.

The Future

The erratic fluctuations of yen exchange of late make it difficult to attempt any estimate of raw silk prices for the next few months. The known difficulties of Japan in the shape of a large adverse trade balance for the past several years and the necessity of heavy reconstruction expenditures render it almost impossible to say at just what level the yen will find a permanent resting place. Foreign loans will certainly be floated but whether these will prove more than a temporary check, time alone will tell.

A permanent level for yen exchange below 40 would insure satisfactory prices to the reelers and low dollar prices to users here. Volume business can only be done at low prices and while too much cannot be expected this spring with 30,000 bales wiped out of the Japan production of the past year, it is possible that high yen prices during the first half of the year will encourage a large crop. American users of raw silk should receive the benefit of this during the second half of year and it would not be surprising to see import records broken once more during the season 1924-25.

Spun Silk Improved in 1923

Second Half of Year Not so Good as First Half But Sales for Full Year Ahead of 1922

THOUGH sharp and sudden transitions from good business to just exactly the reverse marked the twelve months period just closed, the results on the whole can be said to have been satisfactory to the spun silk producers in this country. Total sales for the full year ran considerably ahead of the preceding year and even more in advance of 1921 when the industry was recovering from the drastic slump of 1920. Prices have fluctuated moderately throughout the year with the ups and downs much less marked than in the case of raw silk. Prices have been consistently firm and on a higher average level than in 1923 which would seem to indicate that profit margins have been satisfactory despite the somewhat higher costs of waste silk.

As the year opened business throughout the country was on the up-grade. Manufacturers of silk goods saw the promise of a good spring demand and in January were conservatively anticipating their spun silk needs. Prices were on an attractive basis, 60/1 for instance being quoted at $4.75 a pound. As the buying movement increased and business improved still further, manufacturers covered themselves for longer periods ahead, some placing contracts as far in advance as June deliveries. Sales of spun silk expanded and prices were moved up a notch in February and March, first to $4.85 and then to $5.00 a pound. These advances were the result not only of an improved demand but were due also to higher costs for waste silk and wages. Foreign wastes such as Noshitos, Frisons, and Canton steam waste had gone up considerably as had some of the domestic grades. Domestic waste such as spinners' and winders' waste which could be procured from the throwsters two years ago around 40 to 50c. a pound sold at over a dollar in the spring and still brings close to that figure.

A let-down in business coming in May and continuing through the summer found manufacturers with their needs fairly well covered for this period. As production declined, sales of spun silk fell off considerably. The months of May, June, and July were poor ones although still ahead of the slack months experienced in the years immediately preceding. Prices, however, were kept on a firm basis around the $5.00 level for the 60/1 save in a few instances where concessions were made.

Improvement Sets In

Starting in August improvement was noted and users began to anticipate their fall requirements. With the fall season just getting under way and confidence regained to a considerable degree, came the unspeakable calamity of the Japanese earthquake. For a short time all quotations were withdrawn but producers soon began to sell again with prices irregularly advanced from 50 to 60c. a pound.

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—through centuries the sanctity of a promise or a trust has been kept inviolate, not only by the individual, but by his whole family and tong.

In handling that fragile and susceptible product of the Orient, silk, you will find the LAROS trade mark a guarantee both of good craftsmanship in throwing and of scrupulous integrity in the handling of your property.

R. K. LAROS SILK COMPANY

Commission Throwsters

BETHLEHEM, PA.

TRADE MARK

This was but a nominal rise when compared with the sensational advances occurring daily in the raw silk market and induced considerable buying. September was a good month for the spinners with the additional consolation that most of the contracts placed were on an earthquake price basis.

The balance of the fall period was neither unusually good nor unusually bad. While raw silk was taking its daily plunge during October, sales of spun were naturally at a low ebb. However, those producers who in November quickly rid themselves of the famine idea and went out and quoted sensible prices, found all the business they could handle.

Both the singles and the ply yarns have shared in the increased demand during the year. The 60/1 are used in shirtings and tub silks which have been active, particularly the latter. Tub silks have been used as a sport fabric by quite a few cutters during the fall which helped spun sink. Taffetaline, a less expensive quality of radium crepe, has been a quite active number throughout the whole period. The ply yarns are used extensively in duvetynes, shirtings, sleeve linings, and velvets all of which moved well. Duvetyne while not particularly stressed by Dame Fashion has sold in good volume all during the year. The spun silk crepe yarns have come entirely up to expectations and are receiving more interest right along.

Outlook for Future

The outlook for 1924 is distinctly encouraging. The prospect for the coming year is intimately bound up with the trend of the fabric markets and these offer the promise of expanding operations in the near future and again in the second half of the year. The disturbing element of foreign competition has injected itself into the situation in the past month due to the sudden drop in Franc exchange. This has enabled the Continental spinners to underquote the American spinners and take away considerable business. However, the European producers always raise their prices almost immediately when a drop in exchange puts their quotations out of line and they will probably continue to do this in the future.

New Record in Artificial Silk

(*Continued from page* 194.)

able but an estimate made by a prominent manufacturer this year placed the 1922 total at approximately 80,600,000 lbs. while another factor estimated the world production for 1923 at 90,000,000 lbs. or approximately 50% more than the total production of real silk. Taking the latter figure as a basis, it will be seen that this country produced nearly 40% of the world's total.

Outlets for Artificial Silk

Naturally the knitting industry has continued to consume a very important part of the total artificial silk manufactured in, or imported into, this country. The quantity demanded for hosiery and other knit goods has registered noteworthy increase each year for the last four years and has in turn been responsible for much of the impetus to manufacturers for increase of their plant facilities and output.

Nevertheless, it is important to note that the consumption of artificial silk in weaving has been making rapid strides and that today manufacturers of this fibre freely predict that the future potentialities of this branch of the textile industry as a user of artificial silk are greater than those of any other branch. The development in fine goods weaving in the South particularly has been a subject of comment and the utilization of artificial silk in the fancy dress goods and shirtings woven in the new plants of that section promises to be a most important factor. In addition, there has been an increasing consumption, particularly for combination with real silk, in crepes and ribbons. The excellent crepe produced during the last year by the proper admixture of real and artificial silk has been the subject of much market comment while ribbons utilizing as high a percentage at 75% artificial silk have made a decidedly favorable impression.

Comments of Manufacturers

In connection with the developments of the last year and the outlook for 1924, it is interesting to quote from statements made to TEXTILE WORLD by prominent manufacturers of artificial silk.

S. A. Salvage, vice-president of the Viscose Company, stated as follows: "Prices were very stable throughout 1923 and the consumption in this country was much greater than in any previous year."

An official of the du Pont Fibersilk Co. made the following statement: "We believe that the market is in a very healthy condition and we do not look for a change of prices in the near future."

B. R. Clarke, vice-president of the Tubize Artificial Silk Co. of America, remarked that he regards the weaving trade as one of the major potential outlets for artificial silk in the future.

Eliot Farley, president and treasurer of the Lustron Co., stated as follows: "It is our feeling that one of the very important factors as regards artificial silk is the stability of prices and we feel sure that these will continue stable as they have in the past, and any changes if made will always be downward rather than up. We also feel that the next few years will see very important advances in the manufacture of the acetyl cellulose type of artificial silk, which is in no way competitive with the present Viscose and nitrate types, but which opens up very distinct possibilities for the gray goods mills to obtain two and three color effects on piece goods."

W. W. Birge, president of the Industrial Fibre Corp. of America, stated as follows: "One of the strongest features in the artificial silk market in the past has been the fact that everyone could count on an absolute stability in price. We personally do not think any change radically one way or the other should be made from present standard prices."

Mortality Great

It is significant to know that the production of artificial silk in this country is still limited to comparatively few firms, although a large number have entered the field during these recent years of expansion. It has been estimated that over 100 firms have been incorporated since 1920 for the manufacture of artificial silk. Many of these have never been heard from after the incorporation was announced, while others have experienced difficulty in getting under way.

This emphasizes a point which has been made previously in these columns and which should be noted carefully by any who contemplate engaging in this industry: Mortality among artificial silk firms is extremely high and success is possible only to those who start not only with experience at their command and with sufficient capital to tide them over the experimental stages.

New Name Suggested

The committee which has been representing several trade associations in the consideration of a new name for artificial silk has finally agreed upon the term "Glos." The problem now is to bring this name into actual use. It is realized that there are many difficulties to be overcome and that an extensive publicity campaign is necessary. One obstacle which has been mentioned is the fact that the adoption of the substitute name should be an international proposition. The next year should prove whether or not this radical change is possible.

Foreign Trade

Despite the increased production in this country, artificial silk imports registered a marked increase during 1923. The total "yarns, threads and filaments" brought in during the eleven months ending November, 1923, amounted to 3,690,010 lbs. valued at $6,376,605, as compared with 1,857,917 lbs. valued at $3,471,026, during the corresponding eleven months of 1922.

Concerning exports of artificial silk products, shipments of artificial silk hosiery from this country during the eleven months ending November, 1923, totalled 1,084,774 dozen pair valued at $4,778,691, as against 1,328,050 dozen pair valued at $5,704,515, during the corresponding eleven months of 1922; while exports of other manufactures of artificial silk amounted to 535,039 lbs. valued at $1,560,452, as against 438,214 lbs. valued at $1,281,177 during the same period in 1922.

Price Situation

An example of price stability under trying conditions which the other textile markets could well follow, was furnished last year by artificial silk. During the whole of a period in which conditions ranged from the unusually good business of the spring, to the slack demand noted during the summer and which included the earthquake and chaotic interval in the two months following, prices have held within a very narrow range.

The even course of prices has undoubtedly been a contributing factor in the enormous growth in the use of artificial silk during the last few years. It has encouraged manufacturers and dealers to anticipate their needs for many months ahead for there is not the fear of a precipitate drop with the consequent losses. Knowing that the continually increasing demand would be met with an increasing production, users did not hesitate to experiment with new ideas and combinations which if successful would not be nipped in the bud by a sudden jump in artificial silk prices.

Through the spring users bought actively due to the heavy demand for all cases of goods using art silk. The slackening up in business noted in May and June caused some halt but in another way the price situation which developed reacted to the benefit of producers. Fabrics were selling at a price and manufacturers had to turn them out at a price and one way they could do this was to employ in greater quantity a lower priced substitute for raw silk. This encouraged the production of combination yarns and combination fabrics using a large percentage of artificial silk.

A heavier production taken together with a somewhat reduced demand in the summer caused several producers to announce slightly lower prices at about this time. Throughout the balance of the year quotations have held unchanged despite the Japanese earthquake which at one time caused a heavy buying movement. Interest in the market as a price proposition ceased at the time that the official revision was put through.

It was believed at one time in September following the Japanese disaster that quotations would have to be advanced due to the heavy purchases made by manufacturers who were glad to find one market which was not advancing rapidly. As it clearly appeared later, the course adopted by the larger producers in keeping the quotations at the same levels was a very wise move.

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for fine woolens and worsted
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for fabric decoration—and
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Cheney Silk Yarns are manufactured completely in our own mills, from the raw silk or cocoon to the finished product.

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MILLS: SOUTH MANCHESTER, CONN.

Severe Competition Features Hosiery Year

Many Problems for Mills in Overproduction, Distress Merchandise, Price Cutting and Raw Cotton Advance—Hard Work Necessary in 1924—Increasing Use of Artificial Silk—Chiffons Develop into Staples—Golf Stocking Vogue Increasing—Womens Wool Goods and Mercerized Stockings Poor

HOSIERY manufacturers must look back on 1923 with mixed feelings. For many it was a year of hard work, with results obtained not commensurate with the effort expended. Against the fierce competition which featured the year it was a constant struggle to keep machinery engaged on staples operating at anything approaching full time. Gymnastic fluctuations in raw cotton, and threatened unheavals in silk, did not decrease the number of gray hairs on manufacturers' heads.

For many large and well established manufacturing organizations distributing their product through the jobbing trade profits were undoubtedly disappointing during 1923; for a number of smaller mills the right side of the ledger undoubtedly shows a blank.

Overproduction Difficulties

The presiding ill genius of the hosiery industry, over-production, has been very much on the job, though curtailment has been in effect, at least to some extent, in many sections of the country. There is no question that this excess in productive capacity is the biggest obstacle to the restoration of what may be regarded as normal conditions; estimates as to the amount by which full-time production capacity of the industry exceeds normal consumption in this country average about 25%.

If there is any remedy for this condition in an industry peculiarly adapted to small manufacturing units, none has been advanced. It seems to be solely a matter of the survival of the fittest.

Briefly reviewed, the year was one of spotty and irregular business. Bursts of activity were succeeded by long extended periods of quiet. Following their policy adopted since the war, and putting it into more rigid general practise, jobbers refused to place advance orders for anything like the percentage of their average total business that was considered normal before the war. Numerous small lot duplicate orders were received, the orders usually specifying immediate shipment. Jobbers wanted to buy merchandise today for delivery by express tomorrow, and in a great many instances they were able to do just this.

Distress Merchandise

Distress merchandise was to be found in sections of the market at many times during the year, and its disturbing influence was not inconsiderable. Price cutting, resorted to during dull periods, made it difficult to hold the market at legitimate levels, and at times quoted prices were nothing more than a basis on which to start trading. As the new year opened jobbers claimed that they were still able to buy limited quantities of certain classes of cotton hosiery at practically the same prices as obtained during the summer of 1923, despite the radical advance in cotton during the last six months of the year.

It is probable, however, that at the start of 1924 stocks of distress merchandise had been considerably reduced in comparison with those which existed during parts of last year. The spirit of caution seems fairly certain of being more generally applied to manufacturing operations this year. An uncertain outlook should do much to restrict speculative accumulations of goods. The selling trade is hopeful that 1924 will witness less of the kind of competition which has been called suicidal.

Artificial Silk Development

Probably the outstanding development of the year was the increasing use of artificial silk in combination with other yarns. Pure thread silk seamless hosiery, in both men's and women's goods, has been almost entirely supplanted by fibre and silk mixtures. In women's goods the demand from jobbers for a stocking which could be profitably retailed at $1 made various combinations of silk and artificial silk one of the best sellers of the year.

Fibre plaited on mercerized also enjoyed a relatively good sale. In silk and wools the yarn combinations brought out were almost numberless, and artificial silk was a prominent component of most of them.

Experiments With "New Ideas"

The year was one of almost constant experimentation by many mills with new yarn combinations. In the effort to meet the much-discussed demand of consumers for merchandise within certain price ranges many new ideas were tried out, sometimes, it must be confessed, without due consideration for maintenance of quality.

This trend toward new constructions is one which seems certain of expansion during the current year. Novelty constructions will probably play an increasingly important part in the business, and consumption of artificial silk will undoubtedly show steady gains.

Cotton Hosiery Problems

Satisfactory merchandising of the big volume of staple cotton hosiery production provided one of the major difficulties of the year. Wide and erratic fluctuations in cotton made covering on raw materials a hazardous proposition, and the big jump in the staple during the late summer undoubtedly caught many hosiery mills short, just as it did other consumers of the South's principal product.

In common with piece goods mills, most hosiery manufacturers were deceived by the decline in cotton during the spring, and fully expected to buy their raw material on a basis of approximately 18c. and price their goods for this spring accordingly. The radical advance in the staple to nearly 38c. during the late summer came so quickly that it afforded little opportunity to cover on cotton or yarns, and the problem presented by the new levels is one which has yet to be solved.

Higher prices on all cotton hosiery are expected any day as this is written in the middle of January, and considerably higher levels will have to be reached during the next few months if mills are to do nothing more than break even. The mill which speculates on materially lower prices for crop cotton in pricing its goods is taking ridiculous chances. Bear propaganda cannot grow one extra bale of cotton in the South; 25c. to 28c. cotton at any time this year will undoubtedly look cheap to shrewd buyers.

Low-End Goods

Low-end cotton hosiery must be regarded from contradictory angles. From the pessimistic viewpoint these goods are facing a constantly diminishing market because of restricted immigration and gradual extension of higher standards of living. New arrivals in this country logically present one of the biggest markets for this class of merchandise, and permanent limitation of immigration, in one form or another, seems certain. A natural desire for better wearing apparel generally, and the means to gratify this desire, are turning more and more women from the cheap cotton stocking to higher priced merchandise, notably fibre plaited and silk and fibre mixtures.

On the other hand, the sales volumes reached last year by practically all chain stores and mail order houses is convincing proof that their business on low priced goods, including hosiery, is constantly increasing. The chain stores, in particular, are absorbing steadily mounting percentages of the low-end hosiery production of the country, and they are becoming increasingly important customers of the hosiery mill. It is probable that their gains represent business taken from small retailers all over the country.

A Poor Year for Mercerized

What may be regarded as a movement away from mercerized goods, particularly in women's goods, was clearly observable during the year, especially during the last six months. Selling agents are at a loss to explain the unsatisfactory volume they have received on mercerized stockings unless it is accounted for by the same trend toward higher priced hosiery which has affected low-end goods.

During the summer large city retailers reported something of a spurt in demand for lisle stockings, and toward the close of the year improved business on 240 and 260-needle mercerized goods was received in sections of the primary market. As a class, however, mercerized goods closed the year in unsatisfactory position, and all mills interested in this business will watch the market most carefully this year for developments which will help them to adopt a permanent definite policy on this end of the business.

Among larger organizations there seems to be a distinct tendency toward elimination of the lower priced numbers in their lines and increasing production of higher priced goods. This was manifested during the year by the addition of lines of full fashioned silk goods in mills which had never made them before, increased operations on silk and fibres at the expense of mercerized and other cheaper lines, and reduced operations on 176-needle goods.

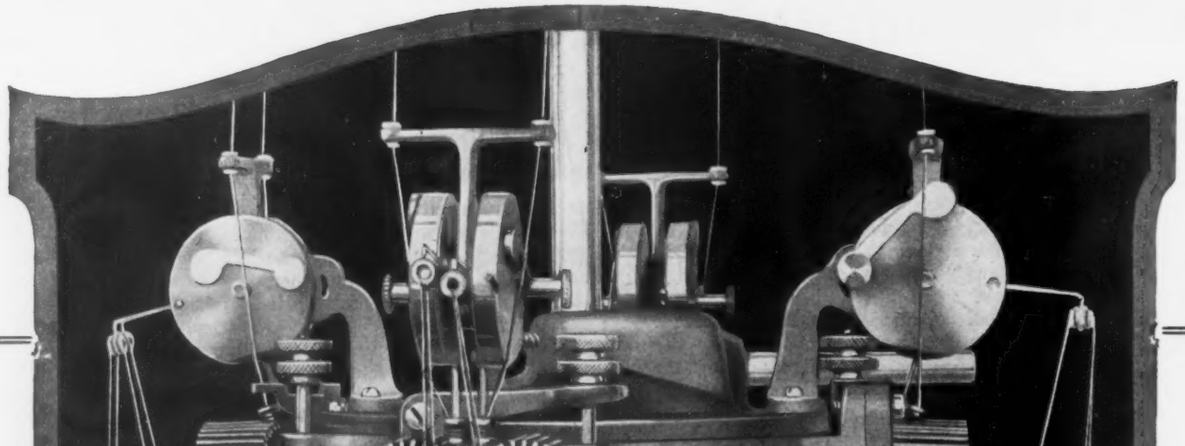
Among commission house sellers, also, there is a growing aversion to handling low-end merchandise; one commission house noted for cheap merchandise has discarded everything in its lines below a 25c. retailer. The reasons for this are obvious. Nominally quoted at $1.15-$1.20 at the close of the year, little volume business had been done at over $1.02½-$1.05 on 176-needle half hose, transferred top. Resistance to price advances is strongest on low-end goods where a relatively small advance takes them "out of the price range."

The Chiffon Vogue

In silk hosiery the outstanding development of the year was the progress of chiffons to the position of staples. Regarded by many as a passing fancy at the start of the year, sheer goods have undoubtedly established themselves as a market staple for some time to come. Beginning as a large-city product exclusively, these goods have found for themselves a constantly widening market, and at the opening of 1924 every indication points to expanding business on them during the new year.

Fall Fashioned Silks

On staple full fashioned goods



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conflicting reports were heard throughout the year. The larger mills continued to dominate the market, and according to their official announcements had little difficulty in selling their product well ahead in six-month periods. Smaller organizations undoubtedly found the going harder. Important changes in prices were not made during the year, and smaller mills found it difficult to compete with the prices named by their larger competitors.

Direct-to-retailer mills generally are understood to have had a satisfactory year on silk hosiery. Their position contrasts sharply with that of some plants selling the jobbing trade which are not backward about making complaints.

Distress stocks of full fashioned goods were in evidence at many periods of the year, shrewd buyers in the jobbing trade being able to pick up exceptional bargains which did not add to the stability of the general market. It is felt that this distress merchandise has been fairly well liquidated as the new year opens, however, and selling agents look for considerably less trouble on this score during 1924.

The range of colors in which silk goods are being turned out has increased tremendously, and the answer to "What will be good?" has become increasingly hard to make. As many as half a dozen variations of popular shades are on the market as this is written. This color problem of the mill striving to furnish "what is wanted" is by no means a small one.

The Japanese Earthquake

The earthquake in Japan in September, with its terrible destruction of life and property, threw a scare into the market. Raw silk prices were expected to sky-rocket, to the accompaniment of heavy demand for raw silk and its manufactures. Sky-rocket it did, in brokers' hands, but the suspension of trading for several weeks by importers and the early resumption of comparatively normal shipments from Japan soon restored the raw silk market to practically pre-earthquake figures. A few hosiery mills raised their prices shortly after the disaster, but large interests stabilized the market by announcing that deliveries would continue at unchanged prices. The amount of high priced raw or thrown silk purchased by hosiery manufacturers is believed to have been negligible.

Wool Goods

Wool hosiery for women, including wool mixtures, did not have a good year. Considerable merchandise was carried over by jobbers for the winter of 1922-23, and there was considerable redyeing of light colors to the darks which had become more popular. It became evident as the year developed that women had definitely turned away from wool goods, so far as the volume of several years ago is concerned.

Mild weather during the closing months of the year hampered distribution of these goods at the retail counter, and the year opened with sacrifice prices being quoted by many mills in the attempt to move stocks. Advance business for fall, 1924, has been practically nil.

In half hose there is a different story to tell. Satisfactory volume is claimed by practically all producers of these goods, and advance business for this fall undoubtedly has been fair to good. Wool mixtures for men seem to be firmly established as a staple. There is every prospect for steady, conservative growth in the volume of this business.

The style trend toward silk hosiery for women, particularly chiffons, added to the troubles of the seller of woolen hosiery. It was helped by the vogue for low, cut-out shoes of the sandal type which disclose numerous glimpses of silk hosiery in attractive colors which formerly would have been entirely concealed by the shoe itself.

Underhose Launched

Another factor influencing all-year round wear by women of silk hosiery, including sheers, was the development of so-called underhose. These thin knitted fabrics, usually of worsted, were first placed on the market in quantity during 1923, and met with an instantaneous success. Extending from ankle to knee they are worn under the sheerest of chiffons without detracting from the appearance of the hosiery, and adding, according to their sponsors, the degree of warmth necessary for winter wear. Increased sales activity on these underhose, now being manufactured by several organizations, may be counted on this year.

Growth in Golf Stockings

Expansion of the business on golf stockings was inevitable during a year in which the game itself made great strides. This is one branch of the business in which expansion may be confidently predicted for a number of years to come. Imports from England and Scotland have undoubtedly taken care of the bulk of this demand, so far as better qualities of wool goods are concerned, but there are indications that mills in this country will pay increased attention to the production of golf stockings.

Important manufacturers who have gone into the subject in some detail claim that it is not a promising field for American mills. England, they say, can undersell us without effort on better quality wool goods. It is apparent, however, that what may be called the low-end division of this branch of the market will show considerable advancement this year. A great many men who never see a golf course will wear "knickers" this year, and for them, as well as for a good percentage of their golfing brothers, it is immaterial whether their stockings be made of fine Australian wool, or of mercerized cotton, or mercerized and artificial silk mixtures, with fancy tops.

It is interesting to note that, if reliable reports are correct, at least one English manufacturer of golf stockings has made plans to establish a plant in the United States for their production.

Three-Quarter Lengths Go Out

Three-quarter lengths in misses' and children's goods were almost entirely superceded during the year by seven-eighths goods with fancy tops, and this condition may be expected to continue through the current year. A direct result of the golf stocking craze, there can be no sensible predictions as to the limits to which this fancy top business will go. With the development of new and better machinery for making these tops in this country they are being constantly improved in appearance and construction, and their market possibilities are especially inviting. Jacquard tops of domestic manufacture are appearing in limited quantities.

Infants' Socks

Definite statements regarding volume and profits on infants' socks during 1923 are impossible because of the conflicting reports received on these goods. Advance business for this spring was undoubtedly not as large as usual, but there have been numerous duplicate orders placed during the latter part of the year, and several mills claim to be sold up into June.

Increased competition on these goods has brought about improved styling, and the lines offered last summer for spring, 1924, were undoubtedly the most attractive ever made in this country. Increasing use of artificial silk here too is a feature, several lines of all-fibre goods being offered. Attractive fancy tops were common, jacquard effects being featured.

Manufacturers feel that the opening of infants' goods was made too early last year, and that this fact was largely responsible for the unsettled market which followed the opening.

Exports of Cottons Increase

A feature of 1923 which should be recorded in this brief review is the increase in exports of cotton hosiery. The latest figures available, for the eleven months ended November, show exports of 4,844,530 dozen pairs, valued at $9,935,758, which compares with 4,364,949 dozen pairs, valued at $8,386,860 exported during the same period in 1922. Exports of artificial silk goods for the 11 month period fell off from 1,328,050 dozen pairs, valued at $5,704,515 in 1922, to 1,084,774 dozen pairs, valued at $4,778,691 in 1923. Thread silk hosiery shipments, however, improved during this period, totalling 407,748 dozen pairs, valued at $4,108,685 in 1923, comparing with 320,979 dozen pairs, valued at $3,147,530 in 1922.

Methods of Distribution

During a year featured by extremely "close" operations by the jobber it was natural that there should be much discussion of the relative advantages of the two main methods of distribution — through the jobber and direct to the retailer. This whole subject is one of increasing importance to the industry, and it is specially treated at some length in another section of this issue.

The menace of the "bell-ringer" selling hosiery direct "from mill to consumer" has probably been exaggerated. With the exception of one organization important strides have not been made by any of those attempting this system of distribution, and there is little reason to believe that an essentially uneconomical selling method will ever obtain much of a foothold.

"Fixed" Retail Prices?

In concluding, it should not be out of place here to point out that the old argument of the jobber and the retailer that they must have goods to sell at a certain fixed retail price is, or should be, worn threadbare. In a few instances, notably low-end cotton goods, this argument may still have some weight, but in most cases it seems to be palpable "buying talk" and nothing more.

What are the "fixed retail prices" so much talked about? How many city retailers are now selling hosiery at definite, established prices beyond which they cannot go? How many mills have not seen their merchandise sold by them as a 50c. retailer priced at retail at 59c., 65c., 69c. or even 75c., with similar variations in other supposedly "fixed" retail prices?

The answers are obvious. The "fixed retail price" is a myth in this day and generation.

Underwear Problems are Many

Constructive Cooperative Work the Bright Spot of 1923, and the Hope of the Future

A GENERAL statement regarding business in knit underwear during 1923, which would be applicable to all branches of the industry, is impossible. Results achieved varied with the class of goods manufactured, and with the geographical locations of mills.

It is possible to venture one sweeping claim for merchandise sold to the jobbing trade: broadly considered, 1923 was probably a more satisfactory year than its predecessor for most mills manufacturing men's goods, particularly ribs. Many and varied opinions are expressed regarding the trend away from fleeces. Women's knit underwear, as a class, undoubtedly suffered further losses during the year, though there are a few who will dispute even this. Little difficulty was experienced in getting volume business on balbriggans, but there are few exuberantly optimistic claims made regarding the percentage of profits resulting from this business.

A More Aggressive Spirit

Happily it is possible to record the fact that the industry seems more

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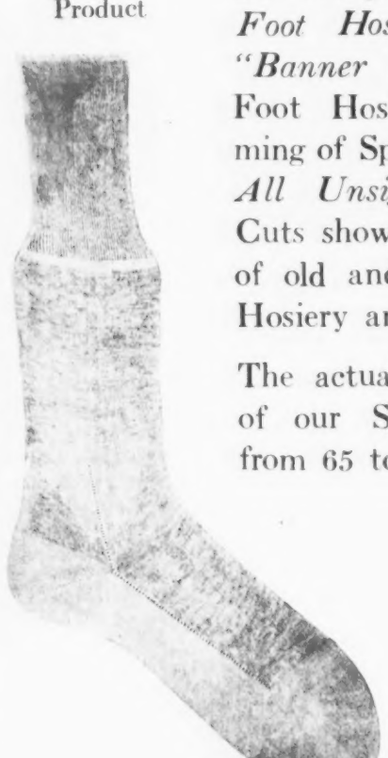

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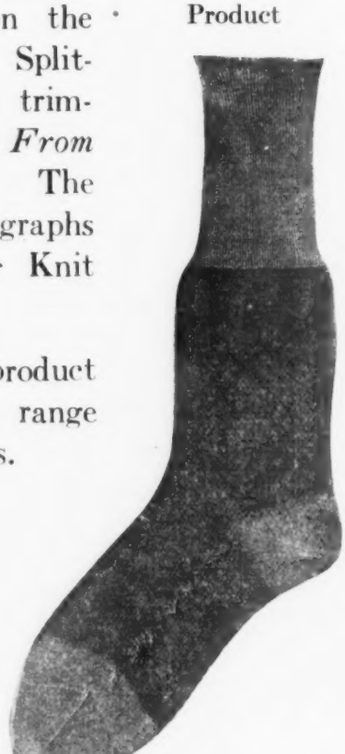

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generally alive to the seriousness of the problems confronting it. Considerable progress has been made along the lines of cooperative attempts to solve these problems, and to the impartial observer the strange thing is that there was not an earlier realization of the necessity for action to counteract the inroads made upon the knit underwear business by cut and sewed goods, in the men's field, and silk merchandise, in the women's end of the business.

The advertising campaign of the Associated Knit Underwear Manufacturers of America was enlarged during the year, and direct results are already discernible by its sponsors. Other aggressive merchandising policies have been taken up cooperatively under the auspices of the association, and further expansion of its good work may be expected this year. These activities will be briefly outlined later in this article.

North vs. South Again

The great problem of the cotton piece goods industry, the differential in manufacturing costs existing between mills in the South and those in the North, promises to make itself increasingly felt in the underwear business. Mills in the South concentrating on men's heavyweight ribbed goods, including direct competitors of the excellently finished and packaged product of New York State mills as well as those running on so-called sub-standard merchandise, operated full-time throughout 1923 on record-making production schedules; similar activity can hardly be claimed for any up-State plant.

The operation of a large branch mill in the South was announced last year by an important Northern manufacturer, and it is not difficult to predict in what section of the country expansion would take place if general conditions in the industry improved sufficiently to warrant it.

Raw Material Troubles

Raw material difficulties featured the year in the underwear business in much the same manner as they dominated the cotton piece goods market, and the development of business from the jobbing trade on cotton underwear largely followed the example set in the major market of cotton products.

Underwear mills were caught short on cotton and yarns by the rapid advance in the staple during the summer, the result being seen in the prices announced during January on heavyweight goods for this fall. It has not been an easy matter to work cotton underwear prices up to a proper basis on raw material costs. As this is written in the third week in January the answer is still to be received to the question as to how the jobbing trade will take to the new prices on heavyweights, which place goods out of the much-discussed "fixed" price range.

Heavyweights Briefly Reviewed

Standard lines of men's goods, ribs especially, received a good volume of advance business during January and February last year and opening prices on a basis of $12 for 16 lb. suits did not last long into the year. The spring months witnessed quiet routine business, accompanied by reductions here and there in the market as cotton sagged off.

Duplicate business during the fall was fair, despite the almost complete absence of cold weather, and most mills undoubtedly closed the year in good shape so far as stock goods are concerned.

Openings of cotton heavyweights for this fall were considerably delayed by the high-cotton problem. Southern mills running on so-called sub-standard goods broke the ice toward the close of November with prices based on $11.87½ for 16 lb. suits, mercerized trim, and $12.12½, silk trim, for early deliveries. Summer deliveries were opened at prices 50c. higher on suits, and were advanced 37½c. in December as a scramble for these relatively cheap goods developed which resulted in quick selling up of the early delivery period.

Up-State mills did not officially name prices on fall goods until the middle of January, their prices being based on $14.50 for 16 lb. latch needle suits, the advance over the previous season's opening prices being approximately 20% on suits and 30% on shirts and drawers. The jobbing trade will undoubtedly operate cautiously at these levels, and volume business may not be received until the late winter or early spring.

Lightweight Shortage Talk

A shortage in lightweights was freely predicted during the early spring months last year, and it actually did develop so far as a few of the better known standard lines are concerned. Wanted quick deliveries were often difficult to get, and it is possible that a general shortage of desirable merchandise did not develop only because of the cold weather which lasted all through the spring.

Balbriggans and lightweight ribs for 1924 were opened officially during the week of July 11, somewhat later than usual owing to the raw material situation. The general run of prices on bal shirts and drawers ranged from $3.37½ to $3.75, the advances over opening prices the previous season being 37½c. on low end goods and 25c. on better merchandise. A 50c. advance was made on one line, placing it at $4.25. Prices on bal suits ranged from $6.00 to $6.50. Standard light weight ribbed suits were opened at $7.25, comparing with the previous season's opening of $6.75.

A break in the cotton market immediately following the opening upset the market to some extent and retarded volume business from jobbers. The staple shortly began its upward march which was to culminate at nearly 38c, however, and jobbers quickly jumped into the market and placed business for the big volume production of leading lines. An especially cheap bal suit was snapped up in short order, and manufacturers of higher grade standard balbriggans were soon placed in the position of refusing further business except from old accounts.

Advances in prices accompanied the upward rush of the raw material; many lines were withdrawn altogether, and prices are now quoted only nominally in a number of instances as this is written. Duplicate business this spring will be a problem for both buyer and seller.

Women's Goods Still Suffer

It is difficult to summarize the year in women's goods. At many times during the year the attitude of the selling market was that the less said about this division of the market the better. Spring merchandise for this year was opened scatteringly at prices approximately the same, or slightly lower than, those named a year previously, and business developed irregularly.

Business is now being taken on heavyweights at prices understood to be unchanged from those of a year ago, and although there are occasional reports of better buying of women's heavyweights, few manufacturers can look forward with much optimism to general improvement in women's knit underwear this year. All reports indicate further increases in the sale of silk underwear for women.

Wool Goods Business

Few complaints are heard regarding business on men's wool underwear during 1923. It is probable that sufficient production has been eliminated from this division of the industry to make successful merchandising likely during the next few years, at least, for those mills now running on wool goods. Good business for 1924 has already been booked by a number of leading manufacturers; it is understood that orders to date for a number of mills are in excess of those booked during a similar period a year ago.

Students in the selling market, however, have not changed their opinion that the trend will continue to be away from wool goods in the long future—a necessary correlary of the increasing vogue for the wearing of lightweights all year around.

Trend Toward Lighter Weights

This tendency toward lighter weight underwear which has been in progress for some years has undoubtedly made further inroads on the total business of the industry on 16 lb. cotton ribbed suits. Individual manufacturers will violently disagree with the statement that fewer 16 lb. suits were sold last year, and some of them undoubtedly can produce figures showing that their sales on 16 lb. garments were larger last year than during 1922.

It is hardly to be questioned, however, that considering the business as a unit, the trend toward lighter weights will continue to make progress, though no one can predict how rapid the strides will be. Some men of long experience in the business can see the eventual practical elimination of the 16 lb. ribbed suit.

Another apparent development of 1923 which affords opportunity for much controversial discussion is the increased volume done on shirts and drawers. In the opinion of some selling agents this development assumed the importance of the beginning of a two piece revival, but others ascribe the larger sales of shirts and drawers solely to obvious reasons, such as the reduction of surplus army stocks of underwear, largely two-piece. It is significant, at any rate, that the percentage of advance on heavyweight ribbed goods for 1924 was larger on shirts and drawers than on union suits.

Sweater Production Overdone?

A feature of the year which cannot be overlooked was the considerable increase in production of staple sweaters and bathing suits by underwear mills in New York State. This has been particularly marked in the sweater end during recent months. Attracted by the large volume of business being done on sweaters, and encouraged to diversification of lines of manufacture by a not-too-encouraging outlook in underwear, a number of mills have only recently entered upon the production of sweaters. Others which previously had turned out lines of this character considerably increased the amount of machinery running on sweaters.

It is impossible to state the eventual outcome of this move. The results of too rapidly expanded production are clearly shown in the current situation on bathing suits, a most unsatisfactory 1924 season thus far being largely the result of added competition for bathing suit specialists from underwear manufacturers.

It should be enough to repeat the opinion of a few in close touch with the situation that productive capacity on staple sweaters is, or soon will be, too great for normal consumption in this country.

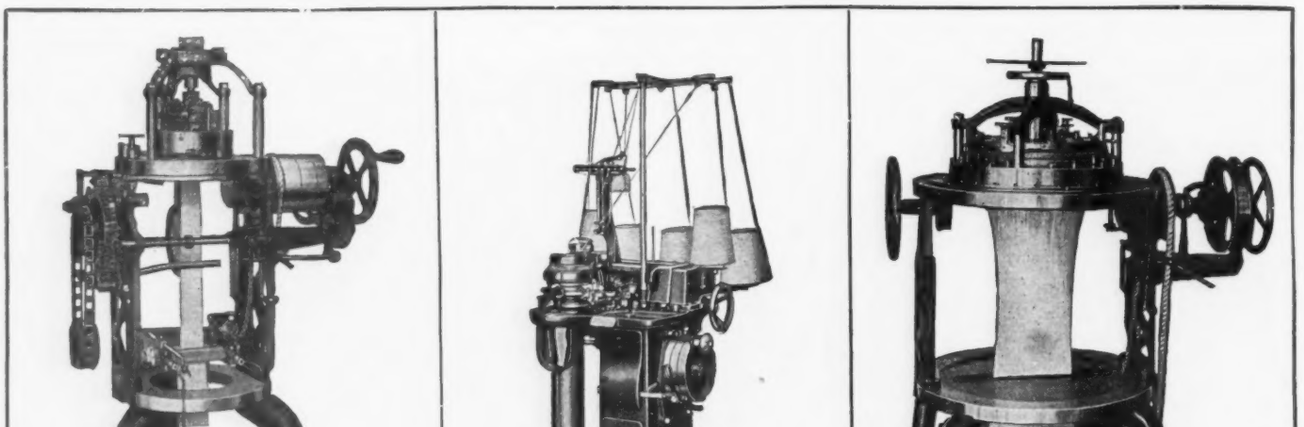
The Well Known Merger

An unsuccessful attempt to form a merger of mills in the Mohawk Valley was made last year, duplicating similar efforts which have been made at various times during the last 15 years. It is what may be called an open trade secret, however, that this last attempt came nearer to a successful conclusion than any of its predecessors, and if rumor is to be believed it has by no means been entirely abandoned.

Trade sentiment seemingly is unanimously to the effect that such a combination of up-State mills would be a good thing for the entire industry, adding a stabilizing influence now sadly lacking.

Shipments to Japan

The earthquake in Japan in September, with its terrible destruction of life and property, afforded an unlooked for opportunity to dispose of considerable surplus stocks of underwear. This matter was capably handled through the cooperation of the Associated Knit Underwear Manufacturers of America with Government officials. The hope has been



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Santiago Scotto, Galeria Guemes, Buenos Aires, Argentine Republic.

H. BRINTON COMPANY, Philadelphia, Pa.

expressed that this wholesale introduction of well made American merchandise into Japan may plant the seed for the development of a permanent market there.

Exports Decline

Regular export business declined during 1923. The latest statistics available on cotton knit underwear, those for the 11 months ended November, show shipments of 1,170,566 dozens, valued at $4,779,134, which compares with 1,551,696 dozens, valued at $5,590,178 exported during a similar period in 1922.

Growth in Nainsooks

Cut and sewed underwear must be briefly dismissed in generalities in this article. Despite the cut-throat competition which has come to be regarded as normal in this business, it is hardly possible to doubt that total volume on nainsooks during the year showed a fair percentage of growth. This is certainly true on the standard, full-sized lines.

Cooperative Activities

Constant expansion of the so-called "athletic" underwear vogue is at last being fought by cooperative advertising and merchandising of knit underwear which gives promise of being effective. The advertising program of the Associated Knit Underwear Manufacturers of America cannot help but accomplish results along the lines of education of the consumer to the advantages of the knitted garment, and evidence is not lacking that a good start has already been made in this direction.

The association is also actively pursuing ambitious programs in similar fields of activity, notable among which is its plan to standardize sizes. Admittedly a scheme which requires much research work, full results cannot be expected for several years, but the possibilities are well worth all the effort that must be expended. In the opinion of many the adoption of American standard sizes for underwear is the most constructive piece of work that is now before the industry.

Other aggressive association activities include the adoption of names to be generally adopted and made familiar to the public for certain types of underwear, regardless of the materials of which the garment is made, emphasis to be placed on the healthful qualities to be expected in bleached underwear, etc.

Thus it is possible to close a short review of a year not abounding in optimistic actual developments with a brief statement of what is certainly one bright spot in the outlook for future years — cooperative attack of mutual problems. It is to be hoped that this work will receive the general support it deserves.

Record Outerwear Volume

New Sales Totals Made on Staple Sweaters—Competition From Underwear Mills a Problem

KNITTED outerwear as a class unquestionably enjoyed its banner year in 1923. Estimates of enthusiasts that a volume of $300,000,000 was done last year may be somewhat exaggerated, but there can be no question that practically all branches of the industry participated in increased business accompanying the constantly expanding vogue for knitted outer garments.

As the new year opens there is some question in the minds of many in the trade as to whether the productive capacity of the industry has not expanded too rapidly on certain lines. Among these lines may be mentioned bathing suits and staple sweaters for men; developments in both of these branches of the market will be briefly discussed later in this article.

Big Business on Men's Staples

In a year when other divisions of the knit goods industry often found it difficult to secure normal advance business from jobbers, quick response was received from them in many cases on offerings of staple sweaters, the big-production end of the outerwear business. In a number of instances openings of staple sweaters for both spring and fall seasons of last year were closely followed by withdrawal of lines, or the restriction of further business to that received from old accounts.

The volume of business received on last year's staple sweaters for men distributed through the jobbing trade undoubtedly set new high marks in sales for many mills.

In women's goods advance business from the jobbing trade was naturally not as large as on men's sweaters, the novelty angle of the business making it difficult for jobbers to operate far ahead. It is apparently becoming increasingly hard for mills selling the jobbing trade only to operate successfully on strictly novelty goods for women. Styles change so rapidly, and with so little advance notice, that the mill catering to the jobber must add the role of prophet to the list of its accomplishments if it is to make much headway.

The highly styled end of the business, in the opinion of seasoned merchandisers, may well be left to the direct-to-retailer mill or to the jobber.

Differ on Current Business

Business received from jobbers to date on lines of staples for this year has been satisfactory, so far as lower priced merchandise is concerned, but there is apparently a considerable percentage of normal volume still to be received on higher priced goods. Prices named were approximately on the same level as those of a year ago, and a number of lines of cotton sweaters and cotton and wool mixtures quickly received all the initial business wanted.

In the higher priced goods there has been complaint to the effect that most of the business placed consisted of sample orders. At any rate, business throughout the market as a whole has not been as heavy, as this is written in the middle of January, as that which was received during the same period a year ago.

The Pullover Reversal

The big style development of 1923 in sweaters was that which left pullovers for both men and women in a rut from which recovery is not yet in sight. Demand swung quickly away from pullovers to the jacquette-type garment, leaving pullovers a drug on the market. The so-called "chappie coat," with variations thereof, has been a big seller, and promises to continue in favor.

Selling agents handling lines for the jobbing trade are confident of the eventual recovery of the pullover and its return to popular favor. They point out the many good points which are conceded to it in the low priced field, and are firm in the belief that the current year will witness at least the start of a movement which will bring the pullover back as a dominant market factor.

Craze for Brushed Effects

During the spring a rush on sleeveless golf sweaters developed which quickly left the market bare of early delivery merchandise. Most of the wanted merchandise was solid colored backs with fancy fronts, usually brushed.

The year also witnessed the height of the craze for brushed effects in all types of sweaters which had been slowly accumulating force for some time. During the late summer and early fall it became almost impossible for buyers to pick up delivery of these garments within a period of four to six weeks, and many of them were interested in nothing else. The resultant scramble for goods forced prices up and created a period of unusually profitable business for those mills able to get in the swim. The popularity of brushed goods will undubtedly continue over into the current year, and it can readily be believed that the startlingly bizarre color effects of 1923 will be outdone this year.

Underwear Mills Competition

The trend away from pullovers logically resulted in increased business on sweater coats, and production capacity on the latter has been materially enlarged. Attracted by the heavy business done late in 1922 and early in 1923 on sweaters, and stimulated by none too healthy conditions obtaining in their own industry, many underwear mills in New York State embarked upon the production of sweaters last year. Mills which had never before turned out goods of this charcater put lines on the market for 1924, and early entrants into the business as a subsidiary activity greatly increased the number of machines running on sweaters.

This added competition has been felt by the mills which have specialized on sweater production, and the feeling is not altogether absent in the selling market that the entrance of underwear manufacturers into the sweater business will shortly be overdone, if it has not already been overdone.

Bathing Suits a Problem

Those whose predictions run in this direction point to the current situation on knitted bathing suits. In this branch of the market the year was far from a satisfactory one, though there are undoubtedly exceptions to this general statement. The trouble that has been experienced in merchandising bathing suits, both wool and worsted and cotton, can undoubtedly be attributed to overproduction, for which underwear manufacturers are again blamed by bathing suit specialists.

An erratic opening of lines for 1924 was shortly followed by price cutting which upset the market and added to the generally unsatisfactory state of affairs. To meet with keen price competition merchandise has been cheapened and sizes skimped to the point where further excesses in this direction can hardly follow. It is no secret that at least a few commission house sellers are contemplating throwing out their lines of bathing suits during 1924.

Knitted Fabric Development

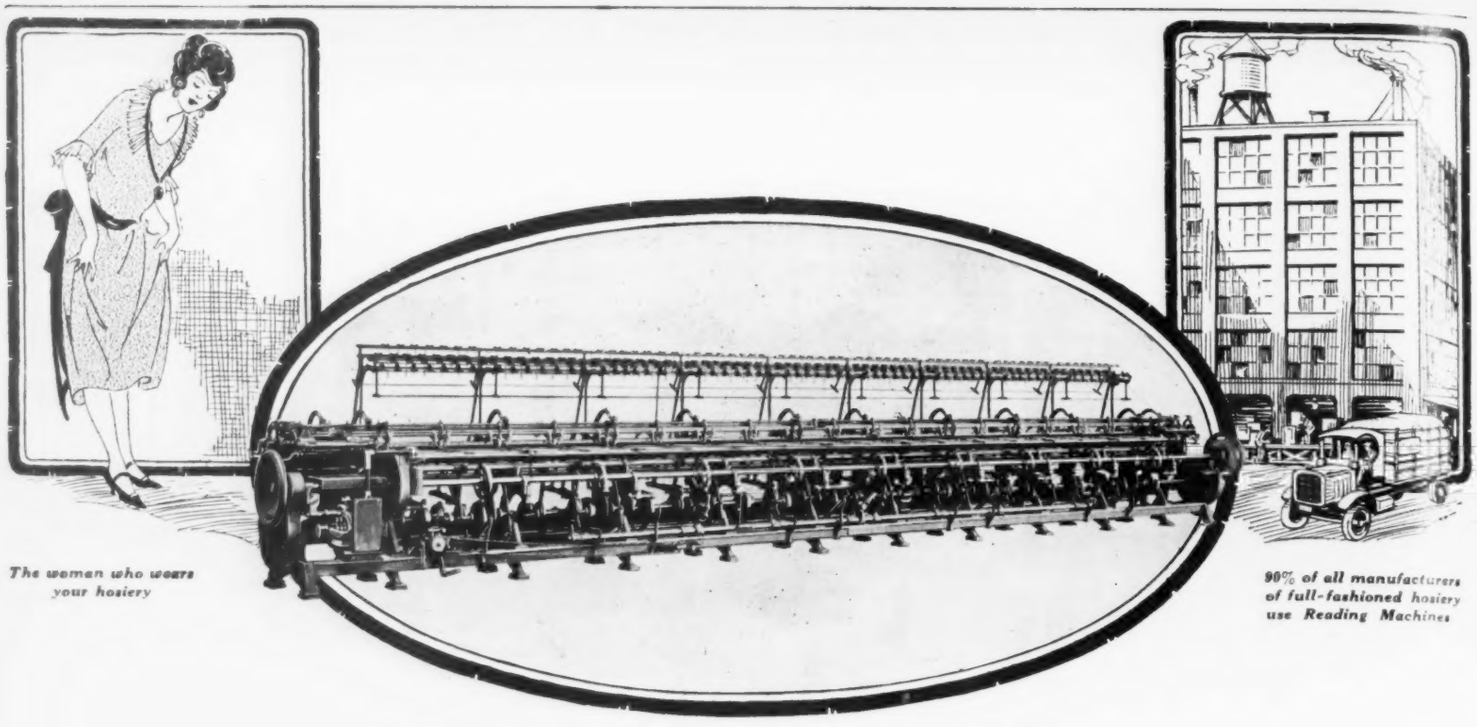
Knitted fabrics have, on the whole, undoubtedly enjoyed a successful year. Many advances have been made in styling, and most attractive color effects in all yarn combinations were offered during 1923. Gradual and steady improvement is being made in technical progress; the knitted fabrics of today are so far ahead of those of only a few years ago that it is ridiculous to make comparisons. There has been an enormous increase in yardage sales over the retail counter within the last few years, and this outlet has been by no means developed to its fullest extent.

It may be a platitude to say again that, as a class, knitted fabrics are still in their infancy, but such is unquestionably the case. The successful development of a circular jacquard machine may be mentioned as one instance of progress along technical lines. Further advances are to be expected within the next few years in finishing methods; in the opinion of many in the trade this part of the manufacturing process is due for striking improvement in the near future.

Neckties and Scarfs

Although not a twelvemonth period of unbroken achievement by necktie and scarf manufacturers, 1923 was a year upon which they can look back with considerable satisfaction. Complaints have been heard against what has been called illegitimate competition from the cut-silk necktie trade, but the knitted tie has prospered during the year and has beyond question gained many new advocates.

Prominent among the events of the



Are you satisfied with the quality of your hosiery?

AFTER all is said and done, the woman who wears your hosiery has much to do with your success.

To her, full-fashioned hosiery means quality hosiery and it *must* live up to its reputation and price.

The Reading Full-Fashioned Hosiery Machine is itself an assurance that your hosiery will rank high in reputation. It is a sturdy machine, made from best materials, and is less complicated and more efficient as to quality and quantity of output than any other machine made.

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FULL-FASHIONED HOSIERY MACHINE

year was the organization in its closing months of an association of distributors of outerwear in New York. This organization of wholesalers is designed to include also manufacturers selling direct to the retailer, and it has ambitious plans, outlined by its president on another page of this issue, for improvement of many angles of the business.

Close cooperation has been established by the new organization with the older association of manufacturers, and considerable good work may be expected from their combined efforts. Among accomplishments to date are the decision to concentrate on certain fundamental styles, to be determined in advance of a season by a joint style committee of the two associations; cooperative action on opening and closing of seasons and a plan to start clearance sales among jobbers on a date to be decided upon and held to by all.

Further Expansion Seen

Nothing now appears on the business horizon to impede steady expansion of the outerwear industry as a whole during 1924. There is no sign of abatement in popular favor of the outdoor sport craze which has been the biggest stimulus to the recent rapid growth of the business. To the contrary, everything points to more general participation in outdoor life by the American people, and progressive increase in volume by the branch of the knitting industry which contributes so much to its complete enjoyment.

Knitted Outerwear Cooperation

Wholesalers Plan Definite Opening and Closing of Seasons, Definition of Style Trends, Etc.

By *Iser Peter Cohen*, President, Knitted Outerwear Distributors Association.

THE splendid manner in which buyers from retail houses throughout the country are responding to the openings of the knitted outerwear spring lines is a striking tribute to cooperation.

The particular cooperation I refer to is that of the manufacturers and distributors selling the retail trade who got together in December and after careful investigation adopted certain types of garments to be featured in their spring lines. After a joint committee of members of the National Knitted Outerwear Association and the Knitted Outerwear Distributors Association had selected the types to be recommended, we held a style show for manufacturers and distributors and got together the largest gathering of its kind in the history of the industry.

The recommended types have been generally adopted with the result that buyers find those types predominating in practically every show room. This takes guesswork out of the buyer's operations. Heretofore the diversity of styles in the various show rooms tended to make a buyer cautious and caused him or her to restrict orders until the season developed to a point that it was clear that certain styles would dominate.

The success attending this initial style show was such that there is no doubt that it will become a semi-annual event.

Three Types Recommended

It is to be understood that while the joint style committee undertook to recommend three garment types, the resourceful manufacturer may be able to produce twenty varieties of each type, but in each the basic style is followed.

Making things easier for the buyer in times such as these is particularly advantageous to all concerned. It makes for good-will, which is something the manufacturer in any line can afford to discount. Buyers appreciate any effort to improve the conditions under which they operate, and the manufacturer or wholesaler who works on this principle and offers attractive, reliable goods at a fair price will reap the benefit.

Cooperative Season Closing

The practical benefits of the initial cooperative efforts lead to the hope that, as the season advances, other progressive measures of which the industry is in need will be put into force. Equally important as deciding when a season shall open is to decide when it shall close. Here, again, in the past, individual guesswork has been harmful.

Some in the trade have anticipated the close of a season by as much as two or three weeks. They started then to close out, slashing prices prematurely and disrupting the market; in fact, arbitrarily cutting the season short for all. It is my belief that the trade will get together again and fix a date for closing the season as readily as the uniform openings were agreed upon. It is suggested that these sales be held semi-annually under the auspices of the Distributors' Association about June 15, for the spring season and Nov. 15 for fall.

Cooperation of this nature usually produces competition that is intelligent and honest, the only kind that is desirable. There is ample room for all in the industry if the recognized principles of fair dealing are followed. It may be pointed out that, from the standpoint of economics, the profits made in legitimate competition are a reward for successful organization and lowered costs of more efficiently managed manufacturing establishments.

The Results of Legitimate Profits

A profit made in this manner is of benefit to the consumer as well as to the seller, for it represents a stimulus to industrial progress and business efficiency. Through further investments of capital, labor and equipment, there then result still larger output and permanently lowered prices, causing production to be carried on by the effective producers, the least efficient being eliminated.

Cut-throat, disorganized methods, misbranded goods and ephemeral selling prices, however, all tend to lower the quality level of goods to the consumer. Unless based upon a new process of production or an improved method of distribution, undue and

Iser P. Cohen.

premature cutting of prices not only prevents profits of established enterprises but, in a measure, endangers the welfare of a whole industry.

The basic principles behind all of the co-operative efforts on our part is the improvement of the relations between retailers and ourselves. We aim to eliminate, as far as possible, the many grievances held on either side and also to exclude guesswork in a highly specialized business.

End-Season Sales

Another problem that confronts us at this time and which is receiving attention is that of clearing out wholesale stocks towards the end of a season. The prevailing haphazard manner of disposing of these stocks by wholesalers pressed for cash or forced by other causes to premature or too urgent liquidation tends to demoralize the entire market. We have in mind concerted closing out sales to be held in New York in November and June of each year. The value of the goods that would be offered at each of these contemplated sales would aggregate considerably more than half a million dollars.

While the idea is something new so far as the knitted outerwear industry is concerned, it is a procedure that has been successfully followed for many seasons by dry goods distributors of St. Louis and Chicago. Executives of the prominent dry goods firms of these cities get together periodically and decide upon the right time to stage what is known as "market week."

Selling to Retailer

(*Continued from page* 195.)

legitimate accounts for the mill which caters to the jobbing trade?

The failure of one attempt to put such a scheme into practice does not necessarily mean that it cannot be done. It seems a little unfair for the mill distributing through the jobbing trade to accept business for the "jobber" doing perhaps $50,000 a year in hosiery and not be able to sell the "retailer" distributing hundreds of thousands of dollars worth of hosiery a year, especially if this retailer will not do business with jobbers, as is often the case.

A factor of importance influencing mills selling the jobbing trade to take on retail accounts is the increasing tendency of large jobbers to control sources of supply, either by outright purchase of mills or by contracting for their entire output.

That there are no hard and fast rules in this whole problem is amply demonstrated by the record of recent years. Concrete examples to support either side are not lacking. To the man who says, for instance, "Look what Kitzmiller is doing" a logical answer is, "Just see what Buster Brown has done."

Further Expansion Likely

To many competent observers it seems inevitable that there will be further successful development in higher priced and specialty hosiery of the direct-to-retailer system of distribution within the next few years. This end of the business is unquestionably best suited for direct selling.

Even here, though, there must be a limit. The ideal retail proposition in hosiery is a branded line, well established with consumers through national advertising. But the hosiery mills of this country cannot all brand their merchandise and advertise it nationally, maintaining its identity down to the consumer. No one in full possession of his faculties would think of selling 176 needle goods direct, for instance.

A merchandising theory which contemplates selling the entire hosiery product of the country direct to retailers is uneconomical and nonsensical.

The Jobber a Fixture

This publication holds no brief for the jobber. His faults are admitted, and constructive action to remedy them should be welcomed. Increasing competition from mills selling direct should stimulate him to more aggressive policies of his own.

Talk of his elimination from the system of distribution for hosiery is ridiculous, however. His place in the economic structure is secure, if, and perhaps because of that, ultra-conservative. He will continue to distribute the mass production of staple hosiery manufactured in the United States, and the manufacturer who does not think so will do well to embark upon a thorough investigation of his own business.

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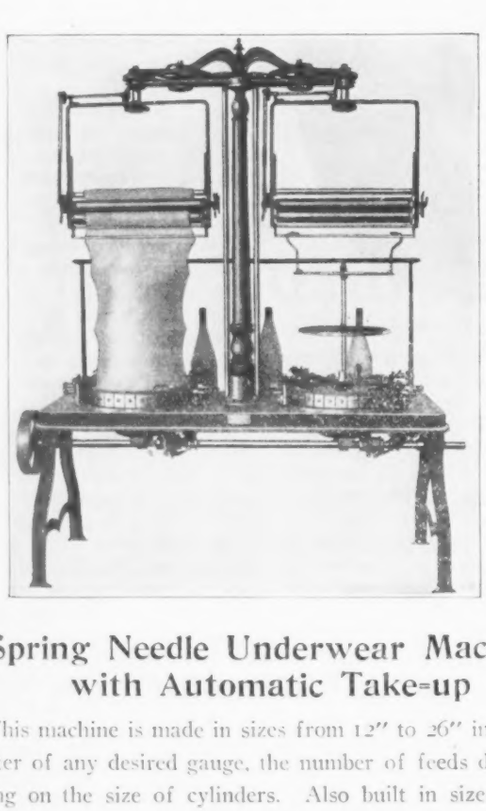

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Patent removable hardened Wing Burr Wheels.

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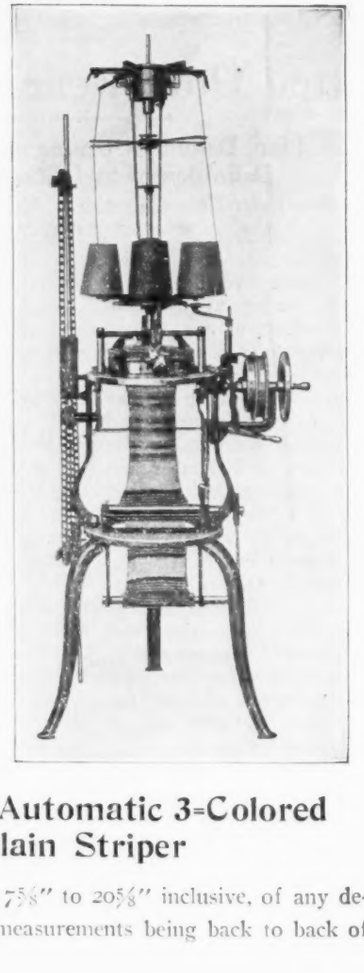

Spring Needle Underwear Machine with Automatic Take-up

This machine is made in sizes from 12″ to 26″ in diameter of any desired gauge, the number of feeds depending on the size of cylinders. Also built in sizes from 10″ to 36″ in diameter for the production of a great variety of fabrics.

Aside from the feeds for plain fabrics, the stockinet, eiderdown and astrachan feeds are superior to any on the market.

Improved Automatic 3-Colored Plain Striper

Made in sizes from 7⅝″ to 20⅝″ inclusive, of any desired gauge; these measurements being back to back of cylinder needles.

The fabrics from this machine are used for bathing suits, theatricals and athletic goods.

These machines are second to none on the market.

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LAKEPORT, NEW HAMPSHIRE

American Dye Industry Continues to Progress

Year Not Marked by Spectacular Developments But by Steady Advancement — Harmonious Relations Between Manufacturers and Consumers—French Seizure of German Dye Plants and Chemical Patent Case Two Interesting Events — Routine Year in Natural Dyes and Industrial Chemicals

THE story of the American dye industry has been relegated largely to the back pages of the newspapers. The popular interest which the creation of a new field of endeavor aroused has subsided to a considerable extent. Even among dye users, the subject of American dyes seems to have lost its punch. It is no longer possible to engage them in lengthy discussions on the comparative merits of domestic and pre-war products. Other matters of more timely significance have replaced this as pertinent topics.

Possibly no greater tribute could be paid to the progress of the American dye industry than this. In a nut-shell, it has become a foregone conclusion that American dyes, type for type, are at least equal to their German predecessors; that domestic manufacturers are supplying the great bulk of colors needed in textile manufacture; and that progress is being made toward the elimination of such gaps as remain. Consequently the purchase of dyes has become a routine matter in plant management and no longer requires the thought and attention of the executives.

With this declining interest in the general subject has gone a far more important development, namely, a practical erasure of the antagonism and cross-purposes which grew out of the legislative fight waged prior to the passage of the tariff act of 1922. Possibly this is the most important accomplishment which will be written on the credit side of the 1923 ledger so far as dyes are concerned. Manufacturers and consumers have buried their differences and each group seems to be as interested as the other in the promotion of a self-contained and complete American dye industry.

Events of Interest

So far as concrete developments during the year are concerned, two events stand out as having an important bearing upon the development of domestic manufacture, namely, the French seizure of German dye plants in the Ruhr district and the suit of the Government against the Chemical Foundation, Inc. for the return of German dye and chemical patents.

The Ruhr seizure threatened to be much more of a far-reaching action than it eventually proved. Possibly the aftermath of this international complication best illustrates the present lack of dependency upon Germany for dye supplies. When the news of the seizure first became known, the fear was openly expressed that American textile plants would be seriously crippled by this development and it was expected that consumers would be greatly alarmed at the catastrophe which had overtaken them. As the weeks went on, however, the whole subject seemed to be of secondary importance and there was little indication of any serious effect upon the operation of domestic mills.

The facts of this seizure are well known to textile manufacturers. Briefly, it resulted from the cessation of delivery of dyes by the Germans on reparations account in January, 1923. As a result, on May 15, the French occupied four German dye plants in the Ruhr district and seized approximately 7,000 tons of dyes. Immediately vague and foreboding rumors became current. One forecast a commercial alliance between Germany and France for joint control of these plants; another indicated the probability of the erection of German plants in this country; while others threatened disaster to the domestic industry through the dumping of these seized stocks.

None of these rumors has thus far materialized. The plants were returned to their owners after reparation accounts had been adjusted; surplus seized stocks were disposed of in an orderly manner, thanks to the representations made by the State Department after the facts in the case had been submitted to it by the Synthetic Organic Chemical Manufacturers of the U. S.; and American consumers seemed to feel little effect from the entire development.

One of these possibilities, however, is still regarded as a live one. As recently as December, Francis P. Garvan, president of the Chemical Foundation, Inc., stated in a public address that the German dye cartel had the avowed purpose of splitting itself up into its component members in order that they might from alliances with American chemical companies, primarily with the purpose of eventually destroying the domestic industry and restoring the monopoly of the German trust. In this connection it is interesting to note that a representative of one of the companies identified with the cartel visited this country in the fall and that it was understood that the purpose of his mission was to enlist the support of American capital in the financing of German dye manufacture. Naturally all this must continue to be largely conjecture but it is freely believed in the dye trade that the domestic industry has to be continually on guard against recurrence of efforts on the part of Germany to regain the valuable market in this country.

DYE PRODUCTION FOR LAST SIX YEARS

(From U. S. Tariff Commission Census)

The publication of the Census of Dyes and Other Synthetic Organic Chemicals for the year 1922 by the U. S. Tariff Commission permits the presentation of the following figures showing production of dyes in the United States for each of the last six years in comparison with the year 1914. The average price per pound for each year is also printed below:

	No. of Firms	*Dyes Produced*	*Value*	*Average Price Per Lb.*
1914...	7	6,619,729 Lbs.	$2,470,096	$0.37
1917...	81	45,977,246 "	57,796,228	1.26
1918...	78	58,464,446 "	62,026,390	1.06
1919...	90	63,402,194 "	67,598,855	1.07
1920...	82	88,263,776 "	95,613,749	1.08
1921...	74	39,008,690 "	32,370,000	.83
1922...	87	64,632,187 "	38,779,312	.60

The Patent Fight

The suit of the U. S. Government against the Chemical Foundation, Inc. for the return of German chemical and dye patents sold to the Foundation by the Alien Property Custodian was another interesting event of the year. The case opened in the U. S. District Court at Wilmington, Del., before Judge Hugh M. Morris in June; was concluded the latter part of July; briefs were filed by both sides in the early part of October; argument was heard in that month; and early this year Judge Morris handed down a decision declaring that the Alien Property Custodian was fully justified in selling the patents to the Foundation and that President Wilson was within his rights when he ordered the seizure of these patents. The judge dismissed the charge of conspiracy on the part of the Foundation to establish a dye monopoly and consequently the decision was a complete victory for that organization. As was expected, the case is to be appealed and carried to the United States Supreme Court.

It is unnecessary here to summarize the voluminous testimony which was presented by both sides during the progress of the case. This has been printed in detail in these columns and has been read by most textile men. It was generally regarded by legal authorities that the case of the Foundation was bullet-proof and that the argument offered by the Government's attorneys was a decidedly weak one. The decision of the Court seemed to bear out this impression.

Possibly the most interesting development during the entire case was the appearance of textile men on behalf of the Foundation and the testimony they gave tending to establish the fact that their needs were amply cared for by the domestic dye industry.

Manufacturing Progress

It is impossible to present complete statistical data demonstrating the progress made in the production of dyes in this country during 1923, either as regards total quantity or class of dyes produced. This information is compiled annually by the U. S. Tariff Commission and is naturally not available until later in the year. However, the columns of this publication bear witness to the fact that new products have been offered throughout the year by various firms. In addition, the two articles following this general summary present the opinions of two experts as to the progress made in cotton, wool and silk dyes.

The most recent official statement, namely the 1922 Census of Dyes and other Synthetic Organic Chemicals, published by the Tariff Commission in July of last year, brought out the interesting fact that the domestic production of dyes by 87 firms was 64,632,187 lbs., an increase of 66% over that of 1921. The report contrasted this achievement with the status in 1914 when seven firms produced only 6,619,729 lbs. It also traced the reduction in selling price from $1.26 per pound average in 1917 to 60c. per pound average in 1922. More important still, it stated that American dyes supplied 93.5% of the domestic consumption. These figures speak for themselves and no doubt will be more illuminating when the 1923 statistics are available.

Market Developments

From a market standpoint, the year was certainly not all that could be desired so far as the dye manufacturers themselves were concerned. The consumers, however, reaped the benefit of price reductions induced by

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An original wool dyestuff

Most—if not all—of the dyestuffs produced in the United States are duplications of products which have already been introduced. Now we have the pleasure of announc ing the introduction of an entirely new dyestuff possessing many desirable qualities.

BRILLIANT ACID BLUE 3B is an acid wool dyestuff of great strength. It produces brilliant blue shades of satisfactory fastness to washing and wearing and does not crock. It dyes level and can be used in combination with other acid dyestuffs.

Wool dyers will recognize the advantages of using Brilliant Acid Blue 3B for it places at their disposal a color producing great brilliancy and strength at a reasonable price.

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increased efficiency in dye manufacture and by particularly keen competition which obtained in the market during the greater part of the year. Purchasing during most of the twelve months was of a routine nature and, although there were certain spurts of buying interests, these were not of long duration. From the manufacturer's standpoint "the most encouraging phase of market development was the tendency on the part of users to contract more freely for future needs, particularly on the tonnage products of course.

Most items on the dye list are today at lower levels than prevailed this time last year; but it is significant to note that during the latter half of the year there was a tendency for the range between quotations in various sections of the market to contract. This indicated the elimination of distress stocks which had confused the trade quite a while and reflected progress towards greater stabilization in dye prices—an accomplishment which was generally regarded as of utmost importance if confidence of buyers was to be maintained.

The decided slump which featured exports of dyes during 1922 was checked last year when, for the eleven months ending November, 1923, 16,662,905 lbs. of "coal-tar colors, dyes and stains" valued at $5,187,687, were exported as compared with 7,045,101 lbs., valued at $3,554,677, during the corresponding eleven months of 1922.

Imports, on the other hand, remain practically stationary, the total quantity of coal-tar colors, stains, dyes, etc., brought in during the eleven months ending November 1923, being 3,005,315 lbs., valued at $4,107,749, as compared with 3,082,089 lbs. valued at $4,447,356 during the corresponding eleven months of 1922.

Outlook for Future

The difficulties which always attend any attempt to predict the future course of a market are intensified in the case of dyes in view of the peculiar conditions affecting this new industry. During the years since the outbreak of the European catastrophe first created the unprecedented condition of dye scarcity in this country, the American industry has grown from practically nothing to a tremendous force capable of caring for the greater portion of consuming needs. It has, however, faced continuous problems of uncertainty which have tended to obscure its future and to make its continued progress a nebulous one. These features of uncertainty included the prolonged legislative tangle, when the form of protection was in doubt; the Congressional investigation, and finally the patent case. All of these crises are passed, and the industry is facing a future whose basic conditions are much more definitely assured than at any time in its history. On the other hand, however, there are still many perplexing problems, such as the elimination of the few gaps which remain in the color line; the stabilization of prices; the elimination of uneconomic duplication in research work and in manufacture; the broadening of export outlets; and finally the further improvement of merchandising methods. It is known that domestic manufacturers realize these problems and it is certain that to the extent to which they solve them will they be successful in continuing a development which has had few superiors in the annals of industrial achievement.

Natural Dyes

The market for natural dyes in 1923 was devoid of any spectacular features. Trading was of a routine nature but on the whole was a sizeable volume on those extracts which find permanent use in the textile industry. Price levels did not change radically but such fluctuations as were noted were largely fractional and in a downward direction. The year started with a tone of confidence pervading the trade and with the expectation of a more satisfactory year in 1924.

It is interesting to note that imports of logwood held their own during the year, the total for the eleven months ending November 1923, being 30,502 tons valued at $554,165, as against 31,175 tons valued at $596,466 during the corresponding eleven months of 1922. Exports of logwood extract on the other hand fell off, the total for the eleven months ending November 1923 being 1,832,917 lbs. valued at $245,595, as against 2,481,986 lbs. valued at $424,599 during the corresponding eleven months of 1922.

Progress in Cotton Dyes in 1923

Steady Improvement in Processes Used in Manufacture of Established Products—New Vat and Mordant Colors—Greater Assortment of Basic Oranges—Two Useful Fast-to-Light Dyes—Additions to Diazotizable Colors—Erica B an Important New Type—Progress in Sulphur Colors

By *Oscar R. Flynn*, Textile and Dye Chemist.

THE list of new American dyes for 1923 is not a long one. For some time past dye research has found expression in a different manner; namely, in an effort to improve the processes used in the manufacture of the products already on the market. This policy has been forced on American dye makers by competition, both domestic and foreign, which however operate in a somewhat different manner. Domestic competition has made it imperative that the greatest economy be practised in the manufacture of the low priced product; while foreign competition has discouraged attempts to create more complicated and therefore more expensive products. The American tariff operates in such a way that Germany cannot successfully compete against the low-priced American dyes, as the difference between the selling price and the ad valorem duty will not pay for the cost of the crudes, the transportation cost and the specified duty of our Government and leave a margin sufficient to pay the German costs of manufacture, low as they are; but with the more complicated and costly dyes, the case is entirely different, as after deducting the various taxes and costs, as enumerated above, a much larger margin is left which is, in many cases, more than adequate to pay the German manufacturing costs.

We perceive the results of the operation of these various influences when we review the progress made during the year in the manufacture of vat colors, which are at the top of the list of colors from the standpoint of complexity and expense in manufacture. We find, by investigation, that but one new vat color has been produced during the year 1923; namely, Hydron Pink F F.

Some attempt has been made to improve the form in which the American vat colors have been put on the market; certain of the vats can now be had in powder form for the benefit of those who require that these dyes should be furnished in a form capable of accurate measurement. We also note that Indanthrene Blue R is now being supplied in a form suitable for use as a bluing material in the finishing of cotton white goods.

Mordant Colors

The same causes which have operated to slow down work on the vat colors have undoubtedly discouraged the production of the fast mordant colors suitable for cotton printing. One true or genuine alizarine of interest to the cotton printer was brought out during the year 1923; namely, the Y. C. A. brand also known as Flavo Purpurine. This is a yellower brand of alizarine and will undoubtedly be very useful to the printers of cotton draperies and furniture cloths.

We also note increased competition in the manufacture of Anthracene Brown R which, however, has been on the market for several years. This color is especially useful in printing all shades of brown. It is not manufactured from anthraquinone, but is formed by the condensation of benzoic and gallic acids.

Another somewhat similar condensation product, namely, Coerulein, is now being produced, perhaps not for the first time, but in a standardized commercial form. In this connection we should note the appearance of Alizarine Black S, corresponding to the old Badische type. This was the most useful chrome black for cotton printing in use before the war. It is not a genuine alizarine, but is a derivative of naphthaquinone and should not be confused with the Bayer product of the same name which was, however, a genuine anthraquinone product and not quite so suitable for the production of jet black in cotton printing.

Basic Colors

The American dye maker has been furnishing us for some time with a rather complete line of basic colors, but there has been a dearth of materials suitable for the production of discharge browns. The cotton printer will, therefore, welcome a greater assortment of Phosphines, among which are redder shades useful for that purpose. There is, however, room for some of the Acridine Oranges from which a satisfactory brown can be produced without the admixture of red.

Another very useful addition has been made to the line of basic colors suitable for discharge printing; namely, Thioflavine T. This was always the color used in the production of discharge greens, being used in combination with Thionine Blue G O, a color which has not yet been duplicated by the American manufacturers.

Fast-to-Light Dyes

The dyer of cotton draperies and similar materials requiring a considerable degree of light fastness has been distinctly benefited by the production of two very useful fast-to-light cotton dyes; namely, Red 8 B L and Blue 4 G L. These American products are in all respects equal to the pre-war types. A fast-to-light red similar to, but not identical with, the genuine Red 8 B L, has been on the market for several years, but owing to the way in which the Bayer patents are held in this country, they were not able, or rather not permitted to produce the real article. In consequence of this restriction, their product, while sufficiently fast to light, has the defect of not being fast to copper and in consequence it cannot be used as a shading color in the production of effects which require after-treatment with copper salts. In this connection it should be stated that the F F brand of Light Fast Blue,

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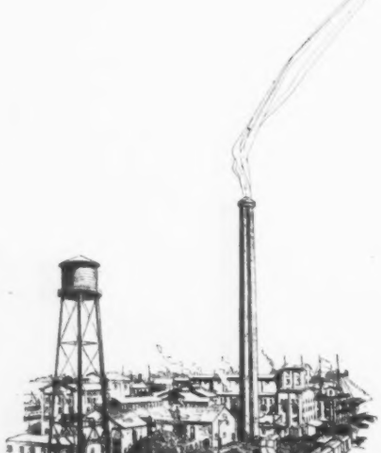
DYEWOOD COMPANY

Logwood Dyes

Nothing yet has been found that can take the place of logwood. No black yet developed has even given the depth of tone, the rich bloom, the amazing fastness resulting from the proper use of this finest of black dyes. When true, uniform blue black is desired on wool, careful dyers the world over turn to logwood.

We have published a little booklet on this subject—"Turning to Logwood." In a brief way it tells the story of logwood, and contains suggestions as to its use. We will be glad to mail you a copy upon request. Write Dept. 152, 100 East 42nd St., New York City.



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which available in a limited quantity for more than a year, is now being manufactured by at least three large dye manufacturing concerns. There has also been some increase in the number of concerns manufacturing Fast Black L, although the new sources of supply, curiously enough, are not found among the larger dye manufacturing concerns.

Diazotizable Colors

There have been some additions to the list of colors which can be made fast to soaping by the process of diazotization and coupling with various phenols and amino compounds. In this list we find a new diazo brown, various blues and blacks. The brown is supposed to correspond to the pre-war Diazo Brown 6 G. However, the pre-war brown was supposed to give a white discharge with hydrosulphite, while the new product is not completely dischargeable with hydrosulphite. However, it seems probable that the American manufacturers are simply more careful in their claims because these products appear to have been made from a stilbene base and consequently should not give a complete discharge with hydrosulphite. Among the new developing blacks and blues should be mentioned one corresponding to Oxy Diaminogene Black O B and another corresponding to Diazo Indigo Blue B R. The latter, owing to improved light fastness and reasonable fastness to washing, should be of interest to the manufacturer of bathing suits.

Direct Cotton Colors

When we come to the consideration of ordinary direct cotton colors we find that there is very little indeed to record. The most outstanding item is the production of Erica B in quantity and of sufficient brilliancy to make it a competitor of Diamine Rose which has so long occupied the field as the only direct pink capable of being discharged white. The Erica B is probably superior to the Diamine Rose in the matter of fastness to light.

While no new members of this series have been created, still there has been a considerable extension in the production of the Benzo Fast Scarlet. It is now possible to obtain any one of the four more important numbers of this series from at least three sources. The dyes in question are Orange S and the Scarlets G S, 4 B S and 8 B S. The more soluable Orange W S brought out by the Bayer Company in 1910, has not been duplicated, which is a matter of some surprise, as, in all probability, the W S brand is nothing more than sulphanilic acid, coupled with J-acid urea. The Orange S, while one of the most useful of the Benzo Fast Scarlet series of dyes, is, at the same time, one of the least soluble and is, therefore, difficult to apply in the production of heavy shades on the padder. On this account there is a tendency to substitute the much more soluble Catechin B wherever this can be done, using the Scarlet G S wherever necessary to get a redder effect. In this connection it is interesting to note that several concerns are about ready to produce Catechin B and possibly the G and 3 G as well.

Sulphur Colors

When it comes to any discussion of new sulphur colors, it is always very difficult to make any definite statements as they are in most cases, at best, mixtures and consequently difficult to classify. We note during 1923 the production of new brands of sulphur greens and bordeaux shades, some of which may or may not constitute new colors. In this connection we note a disposition on the part of different manufacturers to produce the ingredients of sulphur khakis at lower prices either separately or by the production of khaki mixtures which are being sold at prices lower than that which would correspond to the ingredients which enter into the mixture.

A study of the American dye situation never fails to emphasize the handicap under which the American dye manufacturers operate, namely the handicap of destructive competition. The impossibility of cooperating in a legal manner makes it difficult to build up the effective machine which the Germans have constructed. If it were possible for the American dye makers to cooperate and divide the field up among the different members of a dye makers' association, there is no question that America would lead the world in this field of manufacture, as we have an unlimited supply of raw material and all the business and technical ability required.

Progress in Dyes for Wool and Silk in 1923

Steady and Satisfactory Development Noted in These Two Classes—Wide Number of Products Now Available for Chrome Dyeing—Domestic Colors Include 95 Per Cent. of Acid Dyes Formerly Imported From Germany—Few Inconveniences Encountered by Silk Dyers—Injustice of Some Complaints

(Prepared for TEXTILE WORLD *by a Dye Expert)*

THE progress made during 1923 in the development and production of dyes adapted for the wool trade has been satisfactory, and it must be conceded that the dyers of both woolens and worsteds have been pretty well taken care of by the dye makers. Of particular interest to the wool dyer is the extent of the products that are now readily available and applicable for the three classes of chrome dyeing, viz: chrome mordant, ortho-chrome, and meta-chrome. The range of present-day products enables the dyer of raw wool and woolen piece-goods to duplicate every shade suggested by the standard and season shade card.

Reference to the pages of the TEXTILE WORLD for 1923, will show in the advertising columns the activities of both dealers and producers in catering to this class of trade. As to the merits and properties of the available dyes, the dyer has a wide selection to choose from, and if the fastness requirements are determined upon, no difficulty will be experienced in obtaining the proper dye to meet the case. Chrome dyes for wool are not of the simplest class so far as ease of manufacturing is concerned, and it was with some difficulty that most of the dye-makers got their stride in their production. This does not refer to some of those fast direct cotton dyes that are used in wool dyeing, but to the straight chrome dyes. Some of these latter are very complex in their chemical constitution, and it required considerable time before most makers were in a position to make uniform deliveries of products that could be relied upon. Happily, most of the dye users recognized this condition, and were lenient in their demands for the time being, until now their wants are completely taken care of.

The Old "Mixed Types"

One point must not be overlooked by dyers in comparing the dye lists of the pre-war dealers with those of today. Many of what were considered to be definite dyes were simply dye mixtures that were found to be excellent for a number of purposes, and as a consequence, were offered to the trade and sold as specific dyes under several distinguishing names or letters. The multiplicity of these "mixed types" was very confusing, and created the impression that they were "straight products." Many wool dyes were intentionally branded with added letters for the sole purpose of padding the sales list. The dyes from which the "mixed type" is made were generally few in number, and with some minor exceptions, all are now made in this country. As to the value of some desirable and promising mixtures, the American dye manufacturer has not yet caught on to the German trick of merchandising them on a large scale.

The worsted dyer has also had good luck in the matter of dyes for his work. With the exception of a few colors that are needed for unusual jobs, he is well taken care of, and the missing dyes are not of any great consequence. In time they will come, if they are not already prepared for announcement. Today, the American dye-maker is supplying in full quantity — seven or eight — dyes that possess maximum fastness to light, and any complaints as to lack of fastness of dyed shades on worsteds and similar fabrics is pure propaganda, and not to be given credit, or to be taken seriously. The pre-war German dye lists and shade cards, among 50 or 60 other dyes, showed only seven or eight wool (acid) dyes that possessed maximum fastness, and these 7 or 8 are now made here.

At one time, up to the commercial production of alizarine sapphirole, it is true that nearly all compound shades requiring a blue dye were very defective as to light. This was due to the enforced use of an old but otherwise useful dye, indigotine, which was never fast. When sapphirole appeared on the market after several years attempting to produce it, dyers could not see their way to make general use of it owing to its high cost, and continued to do their work in the dyehouse with indigotine. This continued until the public, aware of the availability of the fast blue, actually forced the dyers and mills to make the change to the faster dye. Even today, however, there are some dyers who continue to use indigotine, and place the blame for fading on "poor American dyes."

Producting 95% Acid Dyes

For all general worsted dyeing, including the widest variety of shades, the dyer is able to procure every dye necessary. There are made today in this country about 95% of all the formerly used acid dyes as imported from Germany (Switzerland also exported a lot to this country), a very respectable list in comparison with the old German lists. These 95% do not contain any mixtures, such as are referred to above. In this list are the seven or eight very fast dyes also referred to above, and which are used wherever fast-to-light shades are dyed in our American mills. These fast dyes include a yellow, two oranges, a blue, two reds, a violet, and a black. With these dyes the finest range of shades are to be produced and are produced today wherever fine cloth is colored. From the full line of these dyes, both fast and relatively fast, the American dyer is in a position to duplicate any desired shade for all purposes, with the possible exception of an ultimate fast violet, and no German violet dye was known to be absolutely fast to light.

Any complaints today as to the

Preparatory to Bleaching

Boil your goods in ALLEN WORCESTER KIER

Used in the following Commercial Bleacheries:

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Cranston Print Works
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Lewis Mfg. Co.
Walpole, Mass.

Rockland Finishing Co.
Garnersville, N. Y.

Dutchess Bleachery
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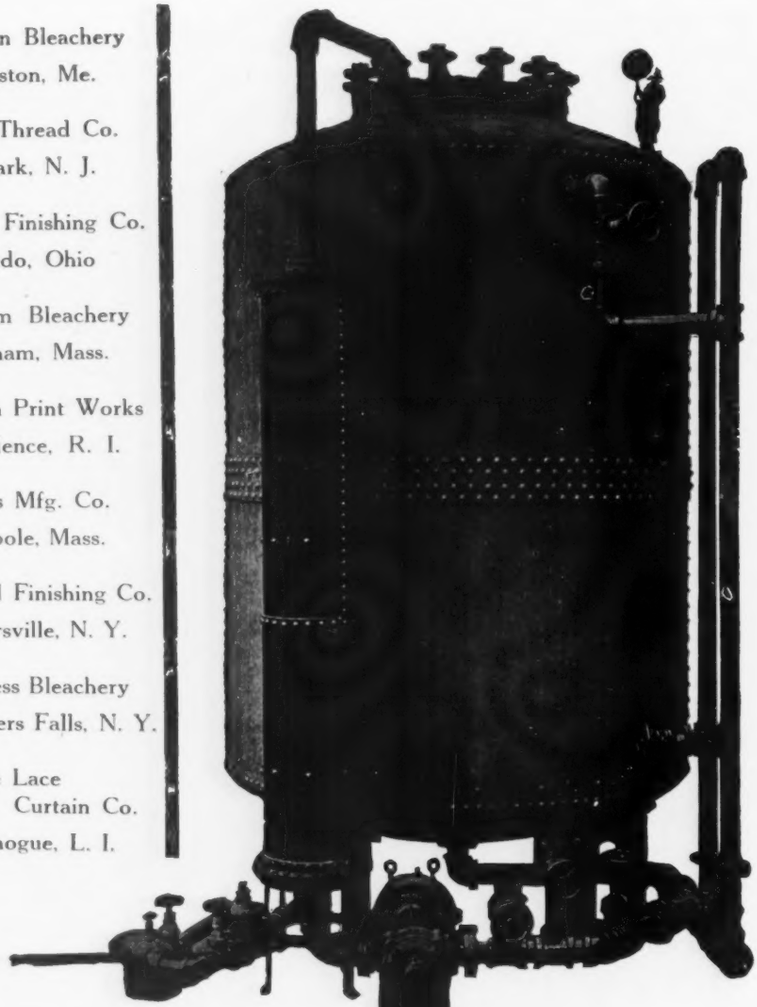
Patchogue Lace Curtain Co.
Patchogue, L. I.



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Bauer & Black
Chicago, Ill.

Pacific Mills
Lawrence, Mass.
Lyman, S. C.

B. B. & R. Knight
Pontiac, R. I.

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Providence, R. I.
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Utica Willowvale Bleachery
Chadwicks, N. Y.

Bellman Brook Bleachery
Fairview, N. J.

Crystal Springs Bleachery
Chickamauga, Ga.

American Finishing Co.
Memphis, Tenn.

The main features of the ALLEN-"WORCESTER" KIERS are:—

PUMP CIRCULATION—Direct connected Motor drive gives **even—continuous** and **positive circulation.**

SPECIAL HEATER—First, **Saving of steam**—Second, **Indirect heating**—allows no **weakening of liquor** during boil—no **tendering of goods** by direct steam is possible—no boiler compound or boiler or feed pipe **rust stains**—and maintains an **even temperature of liquor** during boil.

Third. As goods are **thoroughly boiled** and **even** throughout the kier, there is a big saving in **chemic, sour** and **time** necessary to get a good white, and if goods are used for dyeing the **color lays even.**
New kiers installed and old kiers equipped with this system.

Write for further details

WM. ALLEN SONS COMPANY

WORCESTER, MASS.

inability of a department store or other cloth selling establishment not being able to offer goods dyed fast colors, are to be taken with a grain of salt. If a dyer is instructed to produce his shades with fast colors, he can do it, but the demand must come to him from the middle-men and the jobbers. It is too late for complaints to be entertained as to fastness, long after the sales girl has closed her transaction with the housewife over the counter. Proper dyes are quite available for all classes of dyeing on worsteds, including medium fast, fast, and very fast, just as before the war period.

Silk Dyes Available

As to silk, the dyers of this fibre have been fortunate from the first; indeed, one of the first complete lines of dyes that American dye-makers had was available for the silk trade. This was not due to any effort to see that the silk trade was first served, but that it just so happened. As most of the dyes useful for silk were also useful for the worsted dyer, as a consequence both benefitted. Another point was that the silk dyer was not as particular as the worsted dyer regarding fastness. The silk dyer knew that but few dyes are fast upon silk, especially to light, and consequently he got along most satisfactorily. During 1923, few, if any, inconveniences were encountered. Such as were met consisted almost wholly of a shortage of stock at the moment, which was promptly overcome.

There is a popular misconception regarding new dyes. As a matter of fact, there have not been produced in this country up to the present time, any dyes that can be regarded as new in the sense of not being previously discovered. What dye-makers are doing is to continue to work out the older and well known dyes that formerly occupied a definite position in the dyehouse. Dye chemists have not yet reached the stage where they may devote their entire time to strict research leading to dye discoveries; but what they have done has been to work out the dye processes for the production of dyes that were and are now necessary for the routine dyehouse operations.

Both the wool and silk dyers have been relatively fortunate in being able to secure an almost full line of dyes that enable them to meet nearly all the demands made upon them.

Dyer and Dye-Maker

While not strictly within the province of this article, it may be excusable to mention the relation between the dyer on the one part, and the dye-maker on the other, paying due regard to the ultimate purchaser of dyed textiles, who, in the last analysis, is the one to be satisfied with the purchase, and to pass judgment on its dyeing. If no stipulations are made between the jobber and the mill as to the fastness of the coloring, or the dyes used, it is a sure thing that the mill will use only the cheapest dyes for the job. Goods dyed with such dyes, whether German or of other make, will not stand up under the usual domestic treatment. On the other hand, when the dyer is informed that his dyeings must stand certain tests, then he will select his dyes to meet the tests. The whole situation rests with the mill. Nearly all the trouble that has been given prominence during the past few years has been due to the constant desire on the part of wholesalers and jobbers to buy as cheaply as possible, and when the results were not satisfactory to the final customer, then the worn-out explanation that American dyes were used, and, of course, it is "not to be expected that they would stand up."

On the whole, the progress in dye making as applied to both wool and silk dyes has been satisfactory during 1923, and that the gradual progress made during that year will be continued during the year just opening seems to be assured.

Stability Features Chemicals

Strong Position of Alkalies Particularly Noteworthy During the Year 1923

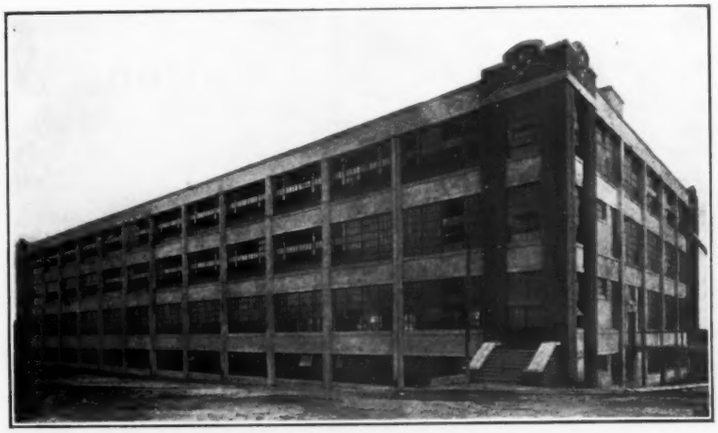
THE outstanding characteristic of the market for industrial chemicals during 1923 was the remarkable stability of two materials of particular interest to textile manufacturers, namely, caustic soda and soda ash. Both these alkalies were featured by unusually large contract commitments and producers were extremely well placed throughout the year. No weak spots developed in these materials at any time in 1923.

During the year the trade adopted a more logical method of quoting on these materials so that instead of naming a price on a basis of 60%, caustic soda is offered on a basis of 76%; soda ash is now quoted on a basis of 58% instead of 48%. Since the present method quotes directly the percentage in which these materials are purchased, the change was a wise one. One of the most significant developments during the year was the announcement of reductions in both caustic and soda ash when 1924 contract prices were announced. This reduction came at a time when demand and production costs would have seemed to warrant either price maintenance or advances and this action helped to instil further confidence into a market which was already notably strong. Contract prices for the current year are on a basis of $3.10 per 100 lbs. for caustic soda 76%, carload lots at works; and on soda ash, 58%, carload lots at works, $1.25 in bulk, $1.38 in bags and $1.63 in barrel.

Unfortunately the same optimistic statements may not be made regarding the cost of bleaching powder, another material of major importance in the textile industry. This chemical has gone through a year of uncertainty and instability. Price cutting was the rule during the summer and early fall, but finally radical slashes in quotations were made by prominent factors and the trade seemed to get down to a more stable basis, although prices were generally believed to be unprofitable on the basis of production costs. Contract prices for 1924 went as low as $1.25 per 100 lbs., car lots at works. The same instability existed in liquid chlorine, but here too radical price revisions finally steadied the trade. A movement looking toward inauguration of open announcement of prices on these two materials created considerable interest and seemed to promise well for the future.

Other materials went through a routine year with prices on the whole fairly well maintained and with reductions, when they did occur, largely fractional and spread over a period of time so that at no part of the year was there an appearance of a price break.

The entire chemical industry starts 1924 with fundamentally sound conditions and with a healthy outlook. Liquidation has been entirely complete and there seems to be no reason why steady and satisfactory trading should not prevail throughout the year.



Hampshire Spinning Co.; A New Fine Combed Yarn Mill at Clover, S. C.

Hampshire Spinning Co.

To Spin Fine Combed Yarn—Has 20,000 Ring Spindles

Hampshire Spinning Co., of Clover, S. C., a new cotton mill spinning fine combed yarns, has been completed and brought into production during the last year. The mill is modern in construction and equipment. The company has built a village along approved lines with a view to the comfort of its employes.

The mill of the Hampshire Spinning Co. is a compact unit, three stories in height with basement. Floor dimensions are 133x294 ft. A two compartment warehouse 100 ft. square, with opener room in one corner, was erected in connection with the mill. The mill is a reinforced concrete structure with daylight steel sash in the side walls and skylights. Floors and ceilings are supported by mushroom columns. The roof is of the concrete slab type and is insulated with Celotex.

The equipment in Hampshire Spinning Co. consists of 20,000 ring spindles and 10,000 twister spindles with winders, doublers, etc., as required by its production. Saco-Lowell pickers are used with Whitin preparatory machinery spinning frames and twisters. The winders and doublers are of Foster make.

The Hampshire Mills are equipped with a conveyor system built by Standard Conveyor Co. The conveyors are used for handling roving yarn and speeding up in other ways work in process on its way through the mill.

The erection of the Hampshire Spinning Co.'s mill has been under the direction of J. E. Sirrine & Co., engineers, Greenville, S. C. The contract for erection of the mill was handled by Gaston Construction Co., contractors, Gastonia, N. C. The equipment in Hampshire Spinning Co. is individually driven by General Electric motors. The electrical installation was made under contract by Huntingdon & Guerry, Greenville, S. C. J. A. Piper Roofing Co. had the roofing contract.

The motors used are as follows: 10 horsepower on breakers; 5 horsepower on finishers; cards are driven in groups, each motor driving one line of shafting through a chain drive; 2 and 4-frame motors on slubbers and roving frames, the 2-frame being 7½ horsepower and the 4-frame, 15 horsepower. Group drive is employed on the ball warpers. The rest of the equipment is all individually driven, the sliver lap being 1 horsepower; the ribbon lap, 2 horsepower; combers, 2 horsepower; spinning frames, 7½ horsepower; winders and doublers, 5 horsepower; twisters 7½ horsepower.

Direct lighting is used, employing R.L.M. reflectors and 200-watt bowl enamelled lamps. American Moistening Co. humidifying equipment and Grinnell Company sprinkler system are installed.

NAPHTHOL GREEN

We are the largest manufacturers in America of NAPHTHOL GREEN—universally admitted to be the fastest to light Acid Green—and best for money value.

AMIDINE FAST RED F

A fast direct cotton red suitable for unions, half silk work. Produces fast shades of red, which can be aftertreated.

AMALTHION BORDEAUX 5B

A new sulphur color of perfect solubility on the blue tone. Produces maroon shades of good brilliancy and fastness.

AMALTHION TAN R

A fast to light Sulphur Color recommended for the dyeing of raw stock, yarn, warp, piece goods, beam, linens, artificial silk, etc. Suitable for machine dyeing, pad and jig work.

ETHONIC FAST NAVY BLUE BL

An acid navy blue recommended for carbonized stock. Excellent for piece goods. Very fast to light.

Send for Samples and Prices

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JOHN CAMPBELL & COMPANY, 75 HUDSON ST., NEW YORK, N. Y.

American Dyestuff Manufacturers

BRANCHES

BOSTON CHICAGO PROVIDENCE PHILADELPHIA MONTREAL

"STANDARDS EVERYWHERE"

ALIZARINES

BEAVER CHEMICAL CORPORATION

DAMASCUS, VA.

SULPHUR COLORS

Two New Colors

First American Production

ALIZARINE RED S POWDER

Schultz 780

SULPHUR SKY BLUE C. F. G.

Brilliant Sky Blue, Green shade similar to Indigo, fast to Chlorine, Washing and Light.

Manufactured by Beaver Chemical Corporation

Stock carried in Boston by

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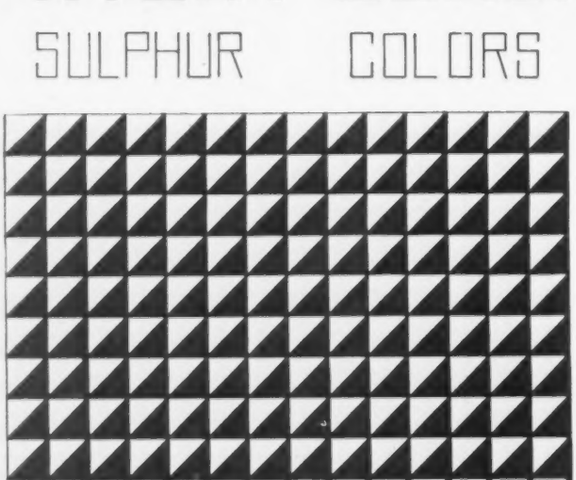
287 ATLANTIC AVENUE
BOSTON, MASS.

ATLANTIC PATENT BLACK

SULPHUR COLORS



ATLANTIC DYESTUFF CO.

Portsmouth N.H.

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We carry in stock a very extensive line of Imported and Domestic

ANILINE COLORS

of

Good Fastness to Light

for

Cotton, Wool and Silk

Write for samples

The L. B. Fortner Company

235 Dock Street, Philadelphia, Pa.

Boston, 102 Pearl Street

POWER AND ENGINEERING SECTION

Developments in Mill Lighting

Studies Show Importance of Speed of Vision in Manufacturing Operations—Higher Intensities Being Employed—Effect on Production and Accidents—A New Industrial Lighting Unit—Development in Suspension of Units Which Facilitates Maintenance of Lighting Equipment

By *Roy A. Palmer**

MODERN lighting equipment is available which compares very favorably with daylight and in some cases is even superior to daylight. While it would have been possible to obtain modern intensities with the old carbon lamps, their efficiency was so low that the cost of operation would have been uneconomical. The high efficiency lamps of today have altered that condition and we can have an abundance of light at a low cost. Furthermore, the numerous advantages of more light which accrue to the workers and employers offset the lighting costs still further until they are but a small fraction of the payroll.

Because the light sources of several years ago were generally of such moderate brilliancy, there was no need to shade them to protect the eyes from undue glare. However, with the introduction of the high efficiency gas-filled lamps, the light source was concentrated and very much brighter. These lamps in many cases were substituted for the older lamps without a change in reflecting equipment. Such procedure in many textile mills accounts for the fact that poor lighting rather than good lighting exists. In order to derive the greatest benefit from a lighting system, it should be properly designed and equipped with proper reflective equipment.

Advantages of Good Lighting

Appreciation of the value of light in industries is manifested by the construction of buildings containing large areas of window space, thereby making most efficient use of natural light. Even in such buildings, however, the daylight intensity falls rapidly as the distance is increased from the windows. On cloudy days or late afternoon hours in the winter season artificial light is needed to supplement fading daylight. Even on bright days some parts of the mill may need artificial light. Changeable character of daylight is many times responsible for inadequate amount of light upon the work with the result that production is hampered and imperfections occur in the goods.

A modern system of illumination will permit a night shift that can work as efficiently as a day shift. Undoubtedly the usual inefficiency of night shifts can be traced to the lack of adequate lighting. A poorly lighted mill is gloomy and dingy and it is quite natural that under such conditions a worker at night — a natural time for sleep — cannot apply himself to the best of advantage.

A considerable amount of test data is now available regarding the numerous benefits attributable to better lighting. These data, together with the fact that many good lighting installations have been installed which show tendencies toward even higher standards than those recommended, serve to substantiate the claims that lighting is a matter of immense importance and fully justifies the costs of installation and operation.

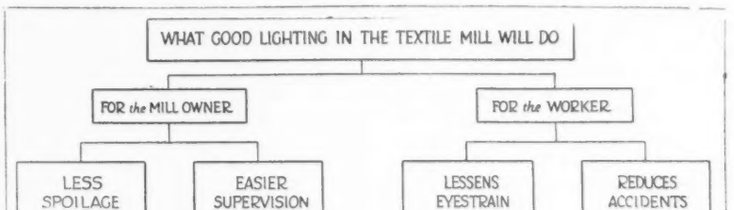


Fig. 1. Advantages of More Light to Employer and Employe.

Speed of Vision Important

For many years, efficiency engineers have made time studies to determine how lost motion and inconvenient working conditions retard the speed of production. These studies brought out the importance of the speed of vision as related to the bodily movements of the worker in performing various industrial operations. Merely "seeing" an object is not the limit of the action of the eye. There are varying degrees of seeing which are governed by the amount of light upon the objects or work. When the amount of light upon the work is increased, the eyes function quicker and easier and the speed of muscular action consequently can be increased. This explains to some extent how production is increased through better lighting.

Tests conducted in various industries serve as substantial evidence that the eyes function more readily under increased levels of illumination. The psychological effect of a well lighted work room together with resulting improved working conditions also serve as a stimulant to production. In a jute mill an increase of 17 per cent was experienced when the illumination was increased from 1.5 foot candles to 9 foot candles. Broken threads on looms or ends down in spinning can be more readily located and repairs on machines greatly facilitated under favorable lighting conditions.

That accidents are reduced by better lighting is well known through the various investigations conducted by insurance companies. Through these investigations good lighting has been placed on a par, and in some cases above par, with mechanical safety devices. In the textile mill, with the numerous machines and swiftly moving parts, the value of good lighting as a safety measure is apparent.

The lighting expense is sometimes regarded as a burdensome item which should be reduced rather than increased. This attitude perhaps results because heretofore it has been somewhat difficult to secure a definie and tangible conception of the value of good lighting. It is, of course, somewhat difficult to determine the dollars and cents value of better lighting from the standpoint of increased safety. However, a study of the numerous accidents which could have been prevented by adequate lighting, together with their cost in compensation and lost time, is quite sufficient to convince one of the need and value of better lighting in the industries. In many cases, one accident alone may cost more than the increased cost of better lighting for a considerable period of time. And the cost of such an accident may be trifling when the humanitarian aspect is given consideration.

From the standpoint of production, we have a definite factor by which we can justify the increased cost of better lighting. When increased production results from better lighting, the efficiency of the working force has been increased, more work is produced by each individual and, as tests show, the increase in work turned out is substantial enough to more than warrant the additional lighting expense. The average of the increased

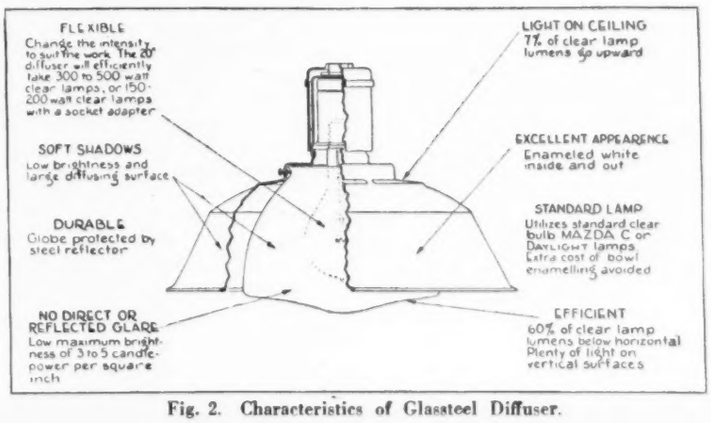
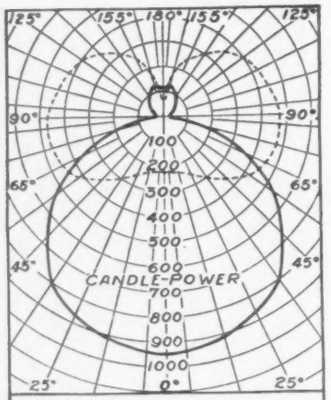

FLEXIBLE
Change the intensity to suit the work. The 20° diffuser will efficiently take 300 to 500 watt clear lamps, or 150-200 watt clear lamps with a socket adapter
SOFT SHADOWS
Low brightness and large diffusing surface
DURABLE
Globe protected by steel reflector
NO DIRECT OR REFLECTED GLARE
Low maximum brightness of 3 to 5 candlepower per square inch
LIGHT ON CEILING
7% of clear lamp lumens go upward
EXCELLENT APPEARENCE
Enameled white inside and out
STANDARD LAMP
Utilizes standard clear bulb MAZDA C or Daylight lamps. Extra cost of bowl enamelling avoided
EFFICIENT
60% of clear lamp lumens below horizontal. Plenty of light on vertical surfaces

Fig. 2. Characteristics of Glassteel Diffuser.

*National Lamp Works of General Electric Co.

costs in lighting in terms of the payroll of ten plants where tests were conducted was 1.96 per cent, while the average production increase was 15.24 per cent.



— THE GLASSTEEL UNIT - 300 WATT CLEAR MAZDA C LAMP

----300 WATT CLEAR MAZDA C LAMP

ZONE	LUMENS	% TOTAL CLEAR LAMP
0- 60	2265	46
0- 90	2924	60
90-180	340	7
0-180	3264	67

Fig. 3. Distribution Curve of a Typical 20-Inch Glassteel Diffuser Using a 300-Watt Mazda C Lamp.

New Lighting Unit

The facts outlined above are evidence that modern lighting constitutes an important cog in the machinery of production. The rapid advance in the standards of illumination and the growing appreciation of what good lighting is and what it will do are constantly bringing about new developments in lighting equipment. A new industrial lighting unit which has a wide application in the textile industry is one of the outstanding developments of the year.

The Glassteel Diffuser, as this unit is called, consists of an enameled steel reflector and a glass diffusing globe which completely encloses the lamp. It therefore combines the advantages of the standard R.L.M. Dome metal reflector and a glass enclosing unit. It is distinctly a high class unit and is admirably suited to textile mill requirements where good appearance together with high efficiency and mechanical ruggedness are important.

Perhaps the outstanding feature of this reflector is the fact that the apparent brightness of the light source is reduced to a minimum. The diffusing area of the glass enclosing globe is considerably larger than that of the bowl enameled lamp and the brightness value is therefore as low as 3 to 5 candle power per square inch. Clear lamps are used in this unit since the glass enclosing globe serves to properly shield the filament of the lamp from the eye.

The efficiency of the Glassteel Diffuser is approximately 65 per cent, or about the same as the standard R.L.M. Dome. With the Glassteel Diffuser the light is not entirely directed downward. Small apertures in the top of the steel reflector permit about 7 per cent of the light to be directed toward the ceiling. This eliminates a "tunnel-like" effect in such rooms where dark materials and equipment do not reflect any appreciable amount of light to the ceiling. The curve in Fig. 3 shows the distribution of light from a typical Glassteel Diffuser.

This unit is made by several manufacturers and is available in 18 and 20-inch sizes. The smaller diameter reflector is equipped with a medium screw socket for 100, 150, or 200-watt lamp. The 20-inch reflector is equipped with a mogul socket for use with 200 or 500-watt lamps. The larger reflector is so designed that by the use of a standard socket adapter, the smaller sized lamps can be employed without distorting the light distribution. This is obviously a distinctive feature, because it provides flexibility in the levels of illumination without the necessity of changing reflectors.

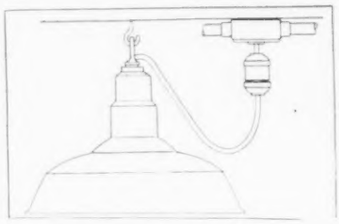


Fig. 4. Suspension of Lighting Unit to Facilitate Removal for Cleaning.

The glass enclosing globe is protected from breakage by the metal reflector, a feature which is important in textile mills because of the necessity of sweeping down at various intervals. The mechanical ruggedness provided by the metal reflector, the desirable quality of light afforded through the use of the enclosing globe, and the favorable appearance of the unit as a whole make it adaptable to the requirements of textile mills.

Maintenance of Equipment

Much light is often wasted through the accumulation of lint and dust upon lamps and reflecting equipment. Regular cleaning schedules should be arranged so that the most light possible will be obtained from the lighting system. More mills each year are adopting such cleaning schedules. Wiping off the units with a dry cloth will assist in keeping the units fairly clean, but washing with soap and water at occasional intervals is necessary in order to keep the lighting system at its highest efficiency.

The walls and ceiling become darkened by dust and dirt and lose much of their reflecting power. Painting them with factory white will restore their reflecting efficiency and enhance the cheerful appearance of the room.

The process of cleaning will be facilitated by the suspension of the lighting units in such a manner that they can be detached and taken down. A suggestion for such suspension is given in Fig. 4. An extra unit which is clean can replace the unit which is taken down. This eliminates the necessity of washing the units while standing on a ladder. The convenience and safety as well as the smaller possibility of lamp breakage by such an arrangement is obvious.

Roofs and Roof Surfaces for Textile Mills

The Different Structural Types and Their Features — Lighting and Ventilation of Mill Rooms — Discussion of Different Construction Materials That May Be Employed — Condensation in Mills — Prevention of Leakage — Suggestions That Will Help Owners to Secure Satisfactory Roofs

By *Walter F. Ballinger* *

This article is adapted from one by Mr. Ballinger which appeared in *The Architectural Forum* for September, 1923. It was originally written for professional readers, though in non-technical language, and was prepared as a summary of the principal features distinguishing the choice of various roof types and roof surfaces. The subject is one of interest and importance to all textile mill owners and superintendents who may be looking forward to enlarging their plants.

A THOROUGH treatment of the subject of roof types and roof surfaces would require the compilation of a vast amount of detail showing many ramifications of modern practice. To encompass this field in a brief space requires much elimination and a rather cursory treatment of the major problems involved in roof design. The principal points discussed are structural types, roof materials and surfaces, condensation and the prevention of leaks.

The simplest form of roof construction is a flat roof supported on beams and girders and columns (Fig. 1). Either wood alone in heavy mill construction, or wood beams on steel girders and columns, or all steel construction is used in this type. Wood plank generally forms the structural surface. Concrete buildings of either flat slab or beam and girder type also come into this classification, which is characterized by the relatively numerous columns placed at regular intervals throughout the interior. The column spacing seldom exceeds 25 or 30 ft.

To procure longer spans between columns trusses of various types are employed, the commonest being "A" type giving a roof of distinct pitch in two directions (Fig. 2), and the Howe truss (Fig. 3), giving a more or less flat roof. The "A" type truss is commonly used without columns for spans up to 60 ft. and occasionally for greater widths, and is built of either wood or steel. The relatively sharp slope of this roof, when used with monitors or other ventilators at the ridge, assists in ridding a building of heated air or obnoxious fumes that are lighter than air, as the gases rapidly seek the highest point and pass out through the openings provided.

Where high humidity must be maintained within a building, as in many textile mills, and where condensation of the moisture with the resulting dripping must be avoided, it is important that there be no obstructions to the free passage of the air along the under side of the pitched roof from the low point to the ridge. Should the moisture laden air be interrupted in its flow by a purlin placed horizontally, for example, the air caught by the pocket thus formed would tend to give up its moisture due to the prolonged contact with the cool roof. The water condensed at this point would drip from the roof and purlin, while the air after cooling would tend to descend out of the pocket to be replaced by more moisture laden air, the process constantly repeating itself. By keeping the heated moist air rapidly moving to the ridge and out of the ventilators, much of the condensation is avoided until the air is actually outside the building.

Larger Buildings

When a building of considerable area is to be roofed, columns become necessary. To combine a series of "A" trusses would result in deep valleys over each row of columns. Consequently, where long spans are required with columns at relatively remote intervals and when ventilation

* President, The Ballinger Company, Architects and Engineers, Philadelphia and New York.

is not a primary requirement, the Howe truss (Fig. 3) or some one of its related types is used. Clear spans up to 80 ft. are common with this truss, and greater widths can be bridged if the cost is not too great a factor. A characteristic of this type of framing is that it requires additional height in a building at the eaves in order to accommodate the truss above the clearance established for the lower chord. Roughly speaking the height of a Howe truss is one-eighth of its span; hence for a one hundred foot span the upper chord bearing the roof would be approximately twelve feet above the lower chord. This adds to the cost of the wall construction and it adds materially to the cost of heating and conditioning this extra volume of air, whenever such is necessary.

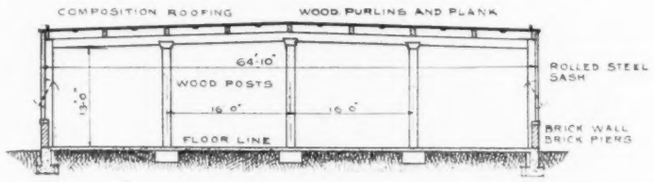


Fig. 1. Example of Building with Flat Roof Supported on Beams, Girders and Columns

Both the "A" truss and the Howe truss are commonly surmounted by monitors which take various forms. The most frequently used monitor consists of two parallel rows of glass on either side of the ridge, with a pitched roof above them, the slopes of the monitor roof being approximately the same as for the main roof. Sometimes a straight roof pitched to drain in one direction only is employed on the monitor.

A variation of this monitor consists in having its roof surfaces pitch downward to the center forming a "V," the bottom of which is generally at the same level as the ridge of the main roof (Fig. 4). The purpose of this reversed form is to eliminate any air pocket, and to assist in the complete removal of moist air or undesirable fumes. As will be noted from the illustrations this kind of monitor places the windows at the highest point.

A modification of this kind of monitor is formed by continuing one surface of a pitched roof beyond and above the ridge for a short distance, and connecting this false ridge with the other roof surface by means of glass sash set at a slope of approximately three inches to the foot away from the vertical. The resulting monitor is thus one-sided, combining the characteristics of a saw-tooth roof with an "A" truss framing. The glass in these monitors is generally faced only to the North as in saw-tooth building to eliminate sun glare and heat, but sometimes it is placed in alternating directions in every other bay without regard to compass points. In this case their function is primarily that of ventilators.

The "high and low bay" roof is useful where long spans are desired with monitor lighting. In this type, the building is spanned crosswise with a series of flat or Howe trusses spaced at regular intervals. Beginning at one end of the building the roof is placed at the level of the bottom chords. The roof between the first and second truss is at the level of the top chords and rests upon them. The roof between the second and third truss is again placed down at the bottom chord and so on down the length of the building. The vertical face of each truss carries ventilating or rigid steel sash so that every other pair of trusses constitutes a monitor with glass sides. By this simple scheme the depth of a Howe truss is utilized with a minimum of waste space.

Saw-Tooth Roofs

Monitors may function both as ventilators and skylights. Under certain conditions the admission of direct rays of the sun through monitors is objectionable because the illumination of the interior is very "contrasty," with bright sunny spots and dark shadows. Furthermore, skylights admitting the sun's rays act as greenhouses; that is, the heat of the sun enters, which is often undesirable, especially in summer time and in plants that are otherwise overheated. To overcome these objections saw-tooth roofs (Fig. 5) are used, consisting of a series of parallel skylights facing the north, and having the glass so placed as to receive none of the direct rays of the sun. The glass may be placed vertically, but a greater lighting efficiency results from sloping the glass to the angle corresponding to the deviation of the sun from the meridian at the summer solstice.

Saw-tooth roofs are constructed entirely of wood, or may be entirely framed with steel or concrete. Generally each valley is supported by a row of columns spaced from 16 to 25 ft. apart, though greater spacing may be obtained with ordinary "I"-beams of sufficient depth. To get long spans several methods are employed.

A Howe truss may be used back of the glass in a perpendicular position from the peak of the skylight or sloped to correspond with the angle of the glass. Owing to the depth required for this truss it is practicable only up to 60 or 70 ft. The use of a Howe truss transversely to the saw-teeth and beneath, them permits of somewhat longer spans, but the cost is greatly increased. This is because the truss requires from 8 to 12 ft. of extra height to the building, and from 8 to 12 cu. ft. of wasted space to be heated and conditioned for every square foot of floor area.

An economical method of framing saw-tooth roofs without columns has been developed and patented by the writer and is called "Super-Span" construction. (Figs. 6 and 7.) The system employs both longitudinal and transverse trusses. Back of the glass is an ordinary truss as above described which supports the roof longitudinally for distances up to 60 or 65 ft. These trusses in turn are supported (at 60 ft. intervals) by a heavier transverse truss, whose bottom chord is at the same level as the valleys and whose top chord extends outside the "sawteeth" connecting their peaks one to the other, the structural members of the skylights becoming the struts and braces. It is somewhat like an ordinary bridge truss except that the angles of the web members are not equal in each pair. Reference to the accompanying illustration will clarify this point.

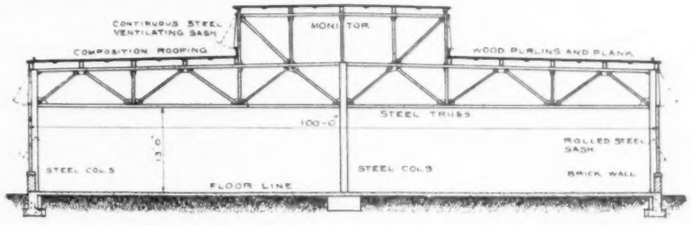


Fig. 3. Example of Building with Flat Roof Supported on Howe Truss

With this system of framing, spans of 100 ft. in width (transversely to the skylights) and of any length whatever are constructed at only slightly greater cost (for the building as a whole) than for a saw-tooth roof supported entirely on columns under each valley. If widths greater than 100 ft. are to be roofed, a row of columns about 60 ft. apart are required for each additional 100 ft., giving a column spacing of 60 x 100 ft.

A fourth kind of roof framing is the wood or steel truss of arch form, suitable for spans of considerable length where very light roof loads are to be carried. They are frequently used for garages or small armories, but when built of wood are not highly considered by fire protection engineers on account of the small dimension lumber used to build up their lattice webs and laminated chords. Two types may be distinguished, the first consisting of a curved truss built up of wood, in which the upper and lower chords are both arched and are nearly parallel to each other. The web members are placed much the same as in a Howe truss. A steel or iron rod in tension connects the ends of this truss like the string to a bow, and takes care of the thrust of the roof. The usual spans for this roof range from 60 to 100 ft.

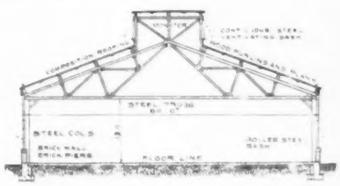


Fig. 2. Building With Roof Supported on "A" Type Truss

The second type which is generally built up of laminated wood members has an arched upper chord and a flat lower chord, the whole forming the segment of a circle. The latticed web members of this truss are arranged according to a rather complex system, and several effective methods of construction are controlled by patents. Spans as great as 100 ft. have been bridged occasionally with these segmental trusses.

Use of Skylights

Skylights are used on all types of roof, sometimes even in conjunction with monitors. They are of two kinds; those that have their glass near to and parallel with the roof surface, called flush skylights; and those having their glass in various arrangements on frames extending well above the roof surface, called standing skylights. Flush skylights are used principally on pitched roofs of distinct slope where their shallow frames are not likely to be flooded,

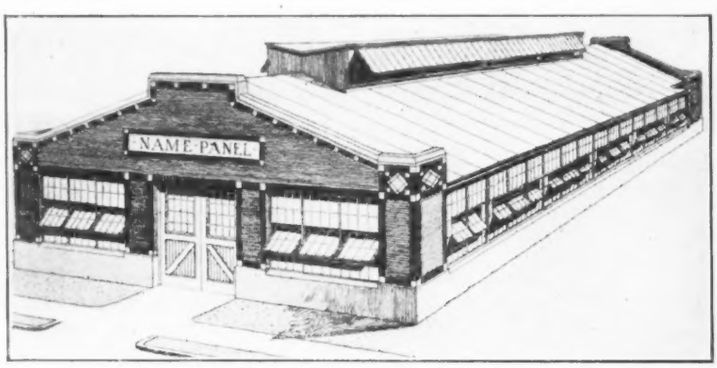
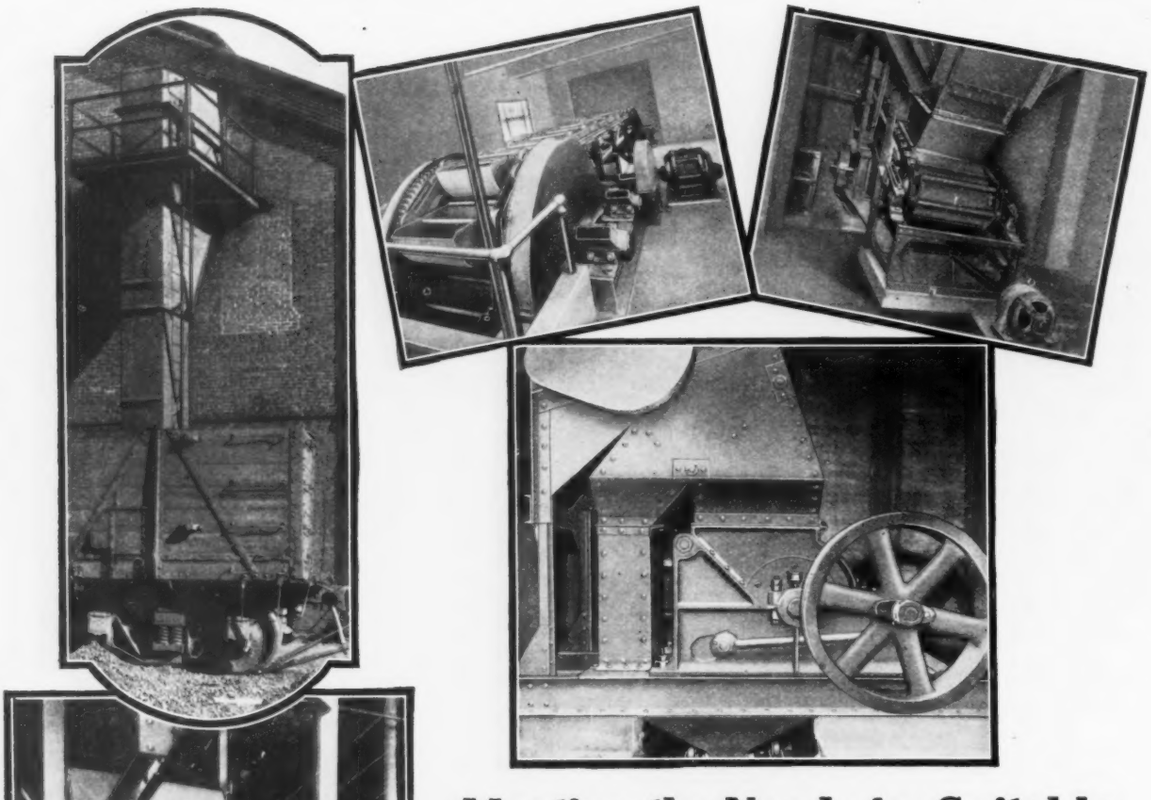


Fig. 4. Example of Building With Monitor Having Roof Surfaces Pitched Downward to Center, Forming a "V"



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and function almost solely as windows rather than as ventilators.

Standing skylights take many forms but very commonly have tops shaped like a hip roof with plain or ribbed glass held in light metal or wood framing. The sides of the skylights may be of glass or metal, but very frequently have ventilating sash like that used in monitors. When ventilating sash is not used other forms of ventilators are employed, as these skylights are mostly used over elevators and stair wells or light courts through which warm and foul air rises and is removed.

Materials of Construction

Turning now from roof structure to the materials of construction we face an even broader field. First to be considered are the materials used for the structural roof itself, the substances used to span the spaces between trusses or purlins, on which the upper waterproof surface is placed. Wood plank is largely used because it is inexpensive and is a fairly good non-conductor of heat and therefore helps to reduce the heat loss from the building and to minimize condensation on the under surface. It is objectionable in several ways, however, the principal disadvantages being that it will rot, and that it is combustible. The tendency to decay may be reduced by various chemical treatments, some of which are sufficiently inexpensive to warrant their use. Wood may be used in the presence of many chemical fumes that would destroy metal or masonry construction.

Concrete is much used for structural roofs where the rest of the building is of concrete. It has many merits, particularly for roofs of flat pitch. Various systems of construction are used; employing gypsum tile, metal tile, burned clay tile and the like, or using ordinary beam and girder or flat slab construction. Concrete requires some insulating layer to prevent excessive condensation under certain conditions.

Gypsum in various forms is coming into wide use because it is a non-conductor of heat and therefore reduces condensation to a minimum. In this respect it is about as effective as wood. Gypsum is non-combustible, permanent, of light weight, and is easily handled. Except under acid conditions gypsum is generally preferable to wood plank.

There are several methods of laying a gypsum roof. One method employs a roof tile or small slab set in angle irons or inverted T's. Another uses a much larger slab of gypsum containing suitable reinforcement. A third uses a stiff gypsum board resembling a prepared plaster-board which is rested on iron framework of the type used to support gypsum slabs. Reinforcing steel is placed above this board and then a gypsum cement is poured over the whole, the board acting as a form that is left in place. A similar method uses a temporary wood form as for flat slab concrete work, with light I-beams at proper intervals. Gypsum cement is poured over wire reinforcing as in the last case.

There are a number of substances which not only form the structural roof surface but also have a suitable weatherproof surface which are used without a top membrane or other surface treatment. Commonest among these is corrugated galvanized iron, which is much used for low cost temorary structures. It is probably the lowest in first cost of any roofing material. Its use is limited by the fact that it will rust in time; that it is attacked by many gases and chemical fumes, and that it is an excellent conductor of heat. This last characteristic connotes that much heat is lost through the roof in winter and that it will be unduly hot in summer sunshine; furthermore that under humid conditions, moisture will rapidly condense on its under surface on cool days.

To overcome the deterioration of galvanized iron and yet retain its relative economy and simplicity, it now comes with both surfaces (and even the edges) covered by one or more layers of asbestos paper firmly cemented to the metal. A great improvement in the life and usefulness of the material has been achieved by this process, although the conductivity has not been lessened sufficiently to eliminate this factor.

Corrugated asbestos or even plain asbestos sheets are used in much the same manner. This material is less subject to deterioration even when exposed to many chemical fumes. It has low heat conductivity and is therefore less liable to permit condensation, although the thinness of the sheets does not afford sufficient insulation when there is any very great difference in temperatures to be combatted.

Corrugated zinc is now being introduced on the market and offers certain merits useful in special cases. Zinc will not rust and therefore a roof of this material will have a high salvage value, suggesting its use for buildings of only a semi-permanent nature. It has a low melting point and would be destroyed by a fire in close contact with it. It will resist corrosion of some fumes but is readily attacked by other chemicals. Like iron roofing, it is highly conductive.

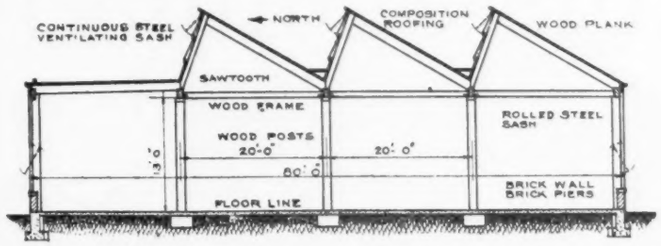

Fig. 5. Example of Ordinary Type of Sawtooth Roof Supported Upon Columns at the Bottom of Each Valley

Corrugated wire glass is similar to the above types, having aside from its translucency the qualities of permanance and resistance to practically all forms of corrosion. If daylight were the prime requisite of a structure, there is no reason why the entire building might not be made of glass supported on a steel framework. The disadvantages of glass are its high conductivity, its weight, and its brittleness. Though wire glass will not shatter under an impact, the cracks that result will admit water unless cemented. The motion of a building due to temperature changes, wind pressure, or internal stresses requires a flexible setting for the glass, which is now entirely practicable. Concrete tile of fairly large dimensions are now on the market which may be used alone directly on the steel channels, whenever air leakage and condensation are not factors, as in boiler houses and foundries. They are adapted only to steep pitch roofs, but require no further surfacing.

Water-Shedding Materials

Wood, concrete, and gypsum roofs require the protection of a waterproof or rain-shedding surface material to give satisfactory results. On roofs of steep pitch materials that will shed water are sufficient, while on flat or low pitch roofs a waterproof membrane must be constructed. Shingles, slate, and tile are the principal water-shedding materials, depending for their overlap and the pitch of the roof to prevent rain from penetrating. Shingles of wood are now seldom used, but prepared shingles of felt paper, of felt with a stone surface, and of asbestos cement are commonly employed in industrial construction. Choice depends on the factors of cost, permanence, fire-resistance, and appearance pertaining to any given problem. Slate and tile are somewhat heavier materials having similar qualities, with like factors governing their choice.

Metals are also used on roofs of steep pitch; copper, tin, and zinc being the materials most employed. The metal sheets are crimped together at the edges and are soldered at all flat seams. The vertical seams are frequently left standing. Copper possesses ideal permanence under most conditions, its use being restricted largely by expense. Tin is the least expensive in first cost but requires regular painting to protect it from corrosion. Zinc is quite new to this purpose, but it appears to have a place between copper and tin, and will doubtless prove satisfactory when its possibilities and limitations are thoroughly understood.

Flat roofs, or roofs having valleys where water may collect as in sawtooth buildings, require that the roof surface be made absolutely impervious to water. Pitch or asphalt with layers of paper or felt, and frequently with a surface of gravel or crushed slag are the materials employed to form a water-tight membrane. The process employed is well known, generally consisting of the application to the roof of a layer of hot pitch or asphalt, over which is a layer of paper or felt, then another layer of binder and another of felt, until four or five layers of the tar and three or four layers of the webbing have been laid. All seams are overlapped as each layer is added. On the last coat of tar fine gravel or ground slag is spread to form a protective surface, keeping the sun from melting the binder.

The characteristics of the several materials employed vary slightly. Pitch has a lower melting point than asphalt and will melt under a hot sun and gradually work down the slope of

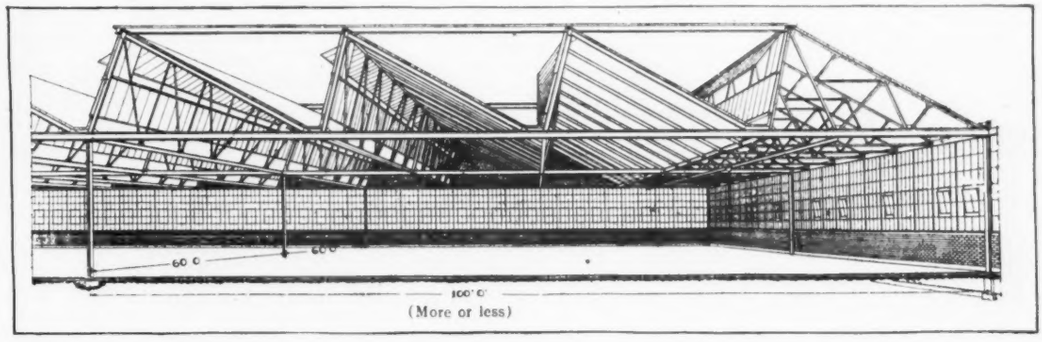

Fig. 6. Perspective View Showing "Super-Span" Sawtooth Construction With 100 Feet Clear Span in One Direction and 60 Feet in the Other

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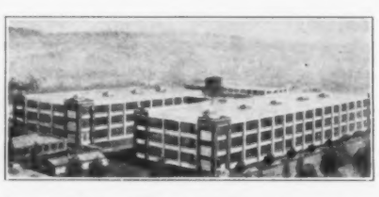

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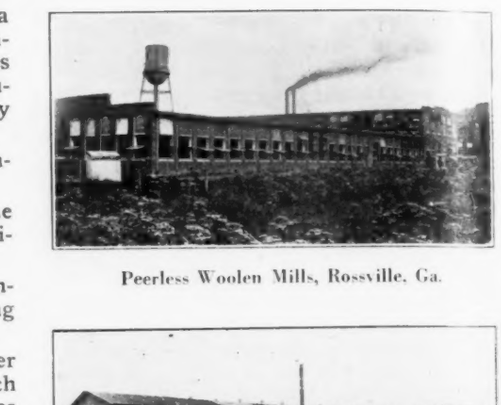
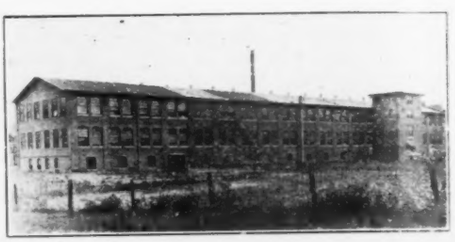


Peerless Woolen Mills, Rossville, Ga.



Signal Knitting Mills, Chattanooga.

Dixie Mercerizing Co., Chattanooga.

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a roof unless protected by gravel or slag. Asphalt does not need this protection and may be left black, although this practice is not desirable on saw-tooth roofs as a light surface greatly increases the amount of light entering the adjacent skylights. The webbing may be of felt paper impregnated with pitch or asphalt, or asbestos felt impregnated with asphalt. The only choice in the use of gravel or crushed slag is to get the cheapest, as either is satisfactory.

For temporary buildings and where first cost is an important consideration, prepared roofing made of layers of tar and paper or felt are in the market in great variety, many having a stone surface rolled on. They are laid with a cemented lap, and if properly laid are practically the same as a built-up roof of equal weight. Vertical surfaces such as the ends of monitors and saw-tooth skylight are generally covered with metal, or with prepared roofing or shingles.

Insulation

To eliminate the difficulties attending the loss of heat through roofs, with particular concern for minimizing condensation on the inner (and in some cases, upper) surface of roofs it is occasionally necessary to interpose a layer of insulating material between the structural roof and the outer surfacing material. Several substances are prepared for this purpose, cork being very commonly utilized. Fibrous mattings or compressed boards are efficient in varying degree. If extreme conditions are being contended with, drip gutters must be placed beneath windows, under beams, and at all places where experience shows drops of water will collect. To avoid condensation on windows it is necessary to use double glazed sash.

The prevention of leakage is simply a matter of using appropriate materials in a workmanlike manner. A leaky roof, in fact, is more frequently to be blamed on the architect for lax specifications and wrong choice of material or method, or upon the owner for parsimonious economy in first cost, than upon the roofing contractor.

Saw-tooth roofs are generally considered by laymen to be always leaking, due largely to this lack of good roof construction. A sawtooth roof, with its many valleys, may be as tight as any other roof. It is simply a matter of good flashings, and of extra layers of felt and asphalt in the valleys to take the wear of persons walking along them to wash windows.

The final point in a satisfactory roof is the flashing at all interruptions in the plane of the roof. These points should be observed. First, the flashings should be of a permanent and non-corrosive material. Second, they should be set in a flexible manner, particularly with wood plank roofs, so that the shrinkage of the wood will not tear the flashing. Third, flashings should be carried above the highest point to which water can collect before overflowing its barriers in case the drains are choked or are of insufficient capacity.

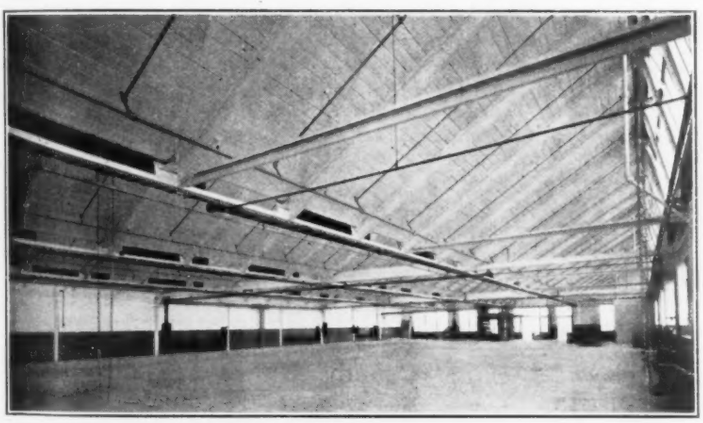

Fig. 7. Interior View, Weave Shed of Ardross Worsted Company, Showing "Super-Span" Sawtooth Roof, Carrying Four Sawteeth Without Columns in the Floor Area

Solving a Mill's Water Problem

Filtering and Softening Plant Installation at Orr Felt and Blanket Co.

By *W. F. Schaphorst.*

THE Orr Felt & Blanket Company Piqua, Ohio, are among the foremost manufacturers of fine quality paper makers' felts and high grade woolen blankets. Unless the products are as close to perfection as can be obtained in textiles they are not Orr standard. The determination to produce the finest felts and blankets could have no better demonstration than the care they have taken with their water supply, the filtering and softening plant completed in January, 1923, being one of the finest installations of its kind in the textile industry. It softens water for the boilers as well as for manufacturing processes.

In the manufacture of felts, blankets and other woolens, water is one of the most important of all the raw product items, for it can easily be the cause of a poor product, even if the best stock available be used. No matter how well the scouring is done, how fine the grade of wool, or how exact the manufacturing process, if the water is not correct, all these good qualities can very easily be destroyed.

Source of Water Supply

The source of water supply is the Miami River, with its troublesome mud and turbidity and its greatly varying hardness. In previous years this water gave considerable concern and required much alertness on the part of the Orr engineers. At certain times of the year the river bed is nearly dry and the soft limestone on the river bottom bleaches and softens in the sun. Under a heavy rain this lime is dissolved, and together with mud and other injurious matter, is carried along in the water of the fast rising stream. The hardness will increase from 10 to 20 grains in a few hours, and the mud will become so heavy that the water is practically unusable.

The problem was handled very well by the installation of a large lime-soda water softening system. Good results were secured but the water had to be watched very closely and the Orr Company officials were still dissatisfied. They wanted a complete solution of the problem, if possible, and decided that they would continue their efforts to obtain a system that would give less trouble in producing a perfect water for their purpose. With this object in view, they sought the aid of engineers who specialize in all kinds of water problems.

Before any apparatus or material can be decided upon every condition must be studied, such as climate, rainfall, temperature, cost of fuel, analysis of the water during different seasons, cost of labor, availability of labor, space available, first cost of apparatus, and so on. As a result, for one extreme condition the engineers sometimes recommend a material to enter into solution with the water. But where a perfect water is wanted from a stream as polluted and variable as the Miami River, the problem is not so simple. What I want to emphasize is that no general rules can be laid down to solve water or scale problems as a whole and no better advice can be given to the manufacturer or power plant engineer than that he present his difficulties to responsible, reputable, and unbiased engineers who are fully conversant with such problems.

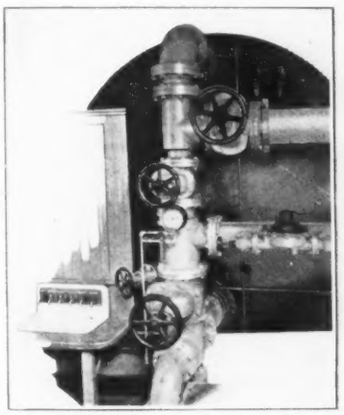

Fig. 1. Water Drawn From Each Faucet is From Different Part of System and Gives Close Control.

The engineers first studied the Miami River water problem from every angle. It was not an easy one, as everybody by this time realized. Finally the solution was arrived at theoretically, after which it remained to work it out practically. The result is absolute agreement between theory and practice, and one of the finest water purification systems in the industry.

The material that was decided upon by the engineers for this plant looks somewhat like coarse sand and is known as zeolite. Its water softening properties are utilized by placing it in a tank and allowing the unpurified water to percolate through it. After it has abstracted its full quota of hardness, the water is shut off and the material regenerated with a solution of common salt in water. The sodium of the salt replaces the lime and magnesia and the material is thus brought back to its exact original condition, ready to soften another quota of hard water.

The completed installation includes

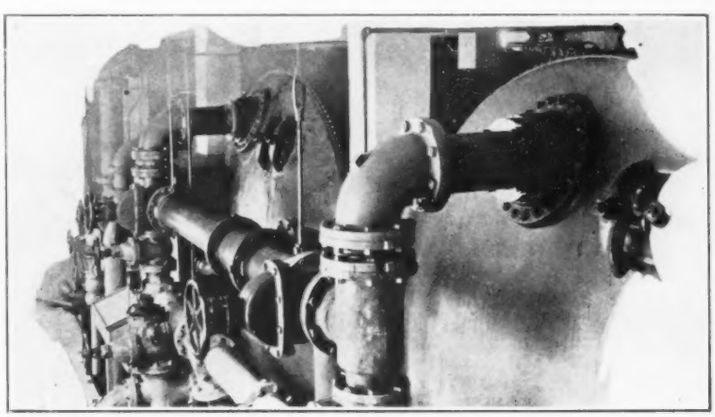

Fig. 2. Softeners and Filter Unit for Handling 250,000 Gallons Every 10 Hours

ALABAMA OPPORTUNITIES

Keeping Pace With the South

The past year has been one of remarkable growth throughout the South. Alabama has kept its position in the forefront of industrial activities; it has made great forward strides in its Textile industries; its agricultural and mineral production have been increased in almost every instance; new and enlarged activities have been developed to utilize its great natural resources. Alabama has more to offer today than ever before.

Alabama Power Company Ranks 12th In U. S. In Energy Supplied

The great increase in the operations of this Company during the past year places it twelfth in the amount of electric energy supplied to the public by Power Companies in the United States. And when present developments are completed this rank will be increased to fifth or sixth.

In keeping pace with the South more than 400,000 horsepower is now available; with 200,000 horsepower capacity under construction. 2,200 miles of high tension transmission lines, covering 25,000 miles of territory in the state. Loop service and inter-connecting lines with entire Southeast. Rates are extremely attractive.

The services and facilities of the Company are available in obtaining specific information regarding any particular field of industry.

ALABAMA POWER COMPANY
BIRMINGHAM, ALA.

a specially constructed building for the housing of softeners and filters, salt tanks, the salt supply, and the feeders. Other units are a 200,000 gallon steel settling tank, remodeled for most efficient results, a 100,000 gallon concrete soft water storage reservoir, and a 1,000 gallon per minute pump for the supply of the water. The system makes available for their use in any one day one-half million gallons of crystal clear water, softer than rainfall, and insures the water being the same quality every day, regardless of variations in the composition of the raw water.

The water from the settling tank passes through a horizontal pressure filter, then through two horizontal pressure softeners of the rapid regenerating type. From here it flows under the control of balanced float valves to the storage reservoir.

For the regeneration of the softeners, a new and specially designed salt dissolving basin was installed permitting the use of cheap salt, dissolving it rapidly, fitering it and then recirculating it to make sure of the proper strength of the brine and a complete dissolving of the salt.

In order to thoroughly treat the water and insure the proper amount of alum coagulant and alkali neutralization, the engineers designed and built a special set of feeders, accurate and positive in their operation, for use in this plant. The main river feed and the solution feed pumps are electrically driven, and the controls are so designed that when the settling tank is at the overflow mark the pumps stop.

Water for Boiler Plant

In the power plant a battery of three 750 H. P. boilers with all the necessary auxiliary equipment supplies steam for power purposes and manufacturing processes. Since the water for these boilers is all supplied from the above mentioned softeners, it is possible to operate the plant under constant heavy overloads without forming a particle of scale or sludge in the boiler tubes.

This permanent freedom from scale, due to the use of pure soft water, means that the boilers are always operating at their best efficiency and can be depended upon to operate under severe overloads and to respond quickly to sudden demands. Boiler cleaning is eliminated and much fuel is saved.

The general efficiency of the Orr boiler room, and its enduringly economical operation are insured by the use of this ideal water, that is filtered and softened by thoroughly modern and scientific equipment. In the end it is found to pay in a finer, more perfect product at minimum production and maintenance cost.

Referring to the illustrations, an interesting detail of the equipment is shown at Fig. 1. At the sink in front of the first softening unit there are six faucets, each one bringing water for examination from portions of the water-treating plant, thus providing close control from the raw river water to the completely softened water.

In the foreground of Fig. 2 are two water-softeners and just beyond them the filter unit. Note the convenience of the piping arrangement and the small amount of space occupied. This equipment not only filters 250,000 gallons every ten hours, but entirely removes fifteen grains of hardness so that the water goes to the various processes and to the boilers absolutely soft.

Fig. 3 shows the tank in which the brine solution is made up and indicates the automatic pumps and float valves by which density or salinity is controlled. From here the solution passes to the regenerating tanks. Fig. 4 is an outside view of the water heating plant, showing the big steel settling tanks and the soft water reservoir, above which the sprays are working. We are indebted to The Permutit Company, New York, for the photographs from which these illustrations were reproduced.

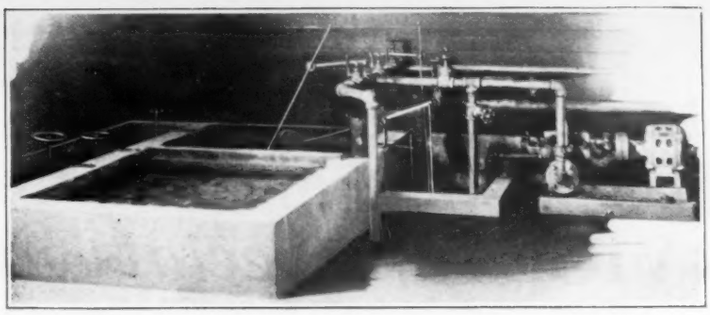

Fig. 3. Tank in Which Brine Solution is Made Up

The Increased Cost of Building

Largely Due to Use of Better Materials and Equipment — Better Mills Reduce Upkeep and Labor Turnover

By *W. Fred Dolke, Jr.**

THE usual type of cost data, based on comparisons of the present costs of building materials and labor with the pre-war costs of materials and labor of the same quality, indicates that an industrial building today is about twice as expensive as it would have been before 1914. However, when we compare present actual unit costs per square foot of building with similar actual unit costs of the earlier dates, we find in a great many instances that the increase is more than twice. Why is this? It seems to me that the answer lies in the fact that more expensive types of building materials and equipment are being used today as common practice.

On the one hand the prospective factory builder and his architect and engineer are being constantly bombarded by a large number of new building materials, new appliances, and new conveniences. Many of these have merit and are worthy of consideration. It is only human nature that men will include some of these new things in the building and the initial cost is thus increased.

* Lockwood, Greene & Co., Engineers, Chicago

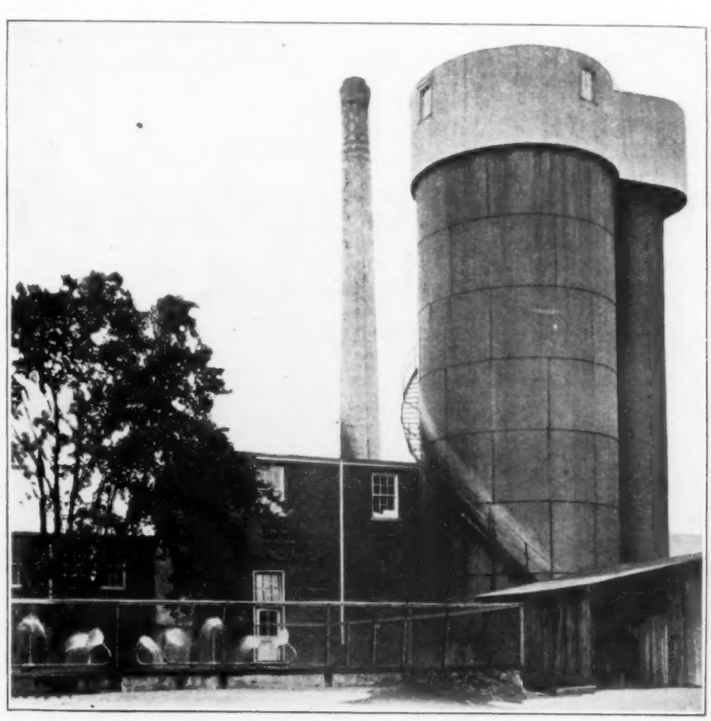

Fig. 4. Settling Tanks and Soft Water Reservoir

Lower Maintenance Expense

Again, the modern industrial manager knows only too well that a deciding factor in profits is overhead cost, and he knows also that maintenance of the plant is frequently a considerable portion of overhead cost. He therefore is willing to make a larger initial investment to secure a building, or appliances, which will cost the least in the long run.

A third factor in the increased cost of industrial buildings is the pride which the modern owner displays in his plant. He wants a better looking building than formerly satisfied him and he asks for better appointments inside the structure. He is willing to pay for it all because he knows that the building advertises the product to the consumer; that a modern, clean, attractive plant interests and holds a good class of labor; in short, that it is a good investment.

Better Equipment

Similarly, better equipment is being used. The individual lavatory has replaced the old plain iron sink. Hot water and liquid soap are more frequently supplied. Enameled steel toilet partitions have replaced the unsanitary wood partitions. Terrazzo floors in toilet rooms are more common. First aid rooms, rest rooms, locker rooms and similar facilities for employes are now provided as common practice.

Improved Lighting

Artificial illumination is better. Not only are larger lamps being used, necessitating larger wires and conduits, but more expensive and more effective types of reflectors are being provided. Extra circuits for night and emergency lighting, for signal systems, and for telephones are now part of standard building equipment.

In the field of heating not only are vacuum systems more common, but the automatic temperature control system is being more frequently installed. Artificial ventilation is a legal requirement in some localities for certain conditions and is more commonly provided in the average factory. Elevators are larger and travel at a higher rate of speed. Many of them are properly equipped with self-leveling devices and with self-opening doors.

Many other items could be mentioned as all of them have economic value. As said above, where more expensive equipment or materials are now used, it is largely because the ultimate cost per year of service is less, or a decreased operating cost is experienced. Nevertheless, these items make the original or first cost more than formerly experienced for a similar type of building.

SERVICE *of special value to the Textile Industry*

The textile industry has seen many changes in the past half-century. Methods have been revolutionized, new processes and machinery substituted for old.

Yet in the face of these changes, there are textile mills in New England, in the South and in the Middle West that have kept pace. They are today as up-to-date as the day they were originally designed. With the help of intelligent and constant engineering service they have made the changes with a minimum of delay and expense, for these mills were ***Built with Foresight.***

Lockwood, Greene & Co., through ninety-two years of varied ever-progressive experience in industrial engineering, have been in especially close association with the textile industry. Through their service they have had a share in the very improvements that have marked its growth. Their organization of engineers, architects, financial men and mill managers have had a part in the up-building of the industry.

Lockwood, Greene & Co. are especially prepared to meet any problem of mill construction or textile manufacturing. Their service is complete, including the valuation of properties for financial purposes, for inventory or taxation.

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A copy of "Building with Foresight," a booklet descriptive of Lockwood-Greene achievements will be sent on request.

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REPORT OF MILL CONSTRUCTION FOR 1923

New Mills, Enlargements and Improvements

Numerous Large Units Added to Cotton Industry of South—Weaving Increase Larger Than Increase in Spinning—Revamping and Improving is Feature of Wool, Knitting and Broad Silk Field—Art Silk Production Facilities Gain—More Finishing Plants—Encouraging Outlook for 1924

MANY projects merely on paper at the close of 1922 were materialized in brick, concrete, steel and machinery during the course of 1923. Many new mills and enlargements to existing concerns were planned and carried into execution, and the year hands on to 1924 more than the usual quota of impressive programs of construction and progress. The developments of last year are monumental evidence of the soundness of the general market for textile products.

The tendency noted a year ago toward the development of big manufacturing units has continued, and the gain in productive capacity of the industry as a whole has probably greatly exceeded the proportion of mere numerical growth. The breadth of the forward movement in the industry may be gauged by the fact that new mills were reported from 34 different States last year as against 29 represented in the report for 1922.

The year of 1923 was marked by an unusual number of enlargements and improvements made to plants of previously existing concerns. In part, this was made necessary by the competition of the many modern and efficient new mill units erected since the war. Older concerns are finding it a paying investment to modernize their plants by reconstruction of buildings or additions, and by the rearrangement, and sometimes replacement, of machinery to take advantage of the changes in manufacture, to simplify handling problems and to put themselves in a position where they know they are getting maximum production out of their annual expenditures.

New manufacturing units added during the year totaled 232 according to records kept by TEXTILE WORLD. This figure must be weighted by some factor based on the great size of many of the units to make it comparable with the figures for 1920, 1921 and 1922, when a great many of the units reported were small. The figures show that 1923 exceeded all years since 1912 with the exception of 1919 and 1920 in the number of cotton and wool goods mills erected. The factor of decline comes largely in the knitting field where the individual units have for the last few years been exceptionally great in number but small in average size.

COMPARISON OF NEW MILL CONSTRUCTION OF LAST TWELVE YEARS

	1923	1922	1921	1920	1919	1918	1917	1916	1915	1914	1913	1912
Cotton	74	57	46	89	74	29	52	51	24	26	27	37
Wool	38	34	36	30	54	24	24	23	19	21	24	24
Knitting	73	94	103	59	84	120	97	113	111	110	142	122
Silk	26	24	31	71	61	49	86	69	25	51	54	46
Miscellaneous	21	29	26	15	16	27	38	33	40	37	30	36
	232	238	242	264	289	254	297	280	219	245	277	265

The Cotton Industry

The number of new cotton mills shows itself about on a par with 1919 and is distinctly exceeded only by 1920. Classification by States shows that nearly 25% of 1923's new cotton mills were in North Carolina. The rest were widely scattered, Texas, California, and Massachusetts reporting from five to seven new enterprises. South Carolina reported a large number of very important additions to existing mills. The year's tendency has been for proportionately greater gains in loomage than in spindleage. A number of large spinners have erected weaving plants to consume the bulk of their yarn, and many of the new companies have machinery for weaving only. Mill development in the South, as might be expected, was the prime feature, and each new mill or addition of any consequence meant a proportionate increase in the industrial village erected by the mill management. Among the large pieces of construction are noted the Lyman (S. C.) Plant of the Pacific Mills, the Mayflower Mill at Cramerton, N. C., the Republic Cotton Mills, Great Falls, S. C., the Art Cloth Mills, Lowell N. C. and the Stark Mills at Hogansville, Ga. The trend toward fine goods manufacture in the South is the outstanding feature of the newest mills in that section. The year also saw the completion of the Farr Alpaca Co's., cotton yarn mill at Holyoke, Mass., and the American Thread Co. has a project well under way for a 30,000 spindle mill at Dalton, Ga.

New Woolen Mills

Of the 38 new wool goods mills, which exceeds all recent years but 1919, 12 are reported from Massachusetts. The American Woolen Co. completed its Shawsheen development and made additions to a number of its mills elsewhere. The Jamestown, (N. Y.) Worsted Mills made extensive enlargements, as did some of the mills in the Middle West. The year saw the completion of the Southern Worsted Corp., Greenville, S. C., which is the first complete worsted mill established in the South. Carpet production has been increased by large additions to Bigelow-Hartford, Alexander Smith, and Mohawk Carpet Mills, and by the new plant of Barrymore Seamless Wilton, Inc., Holmesburg Junction, Pa.

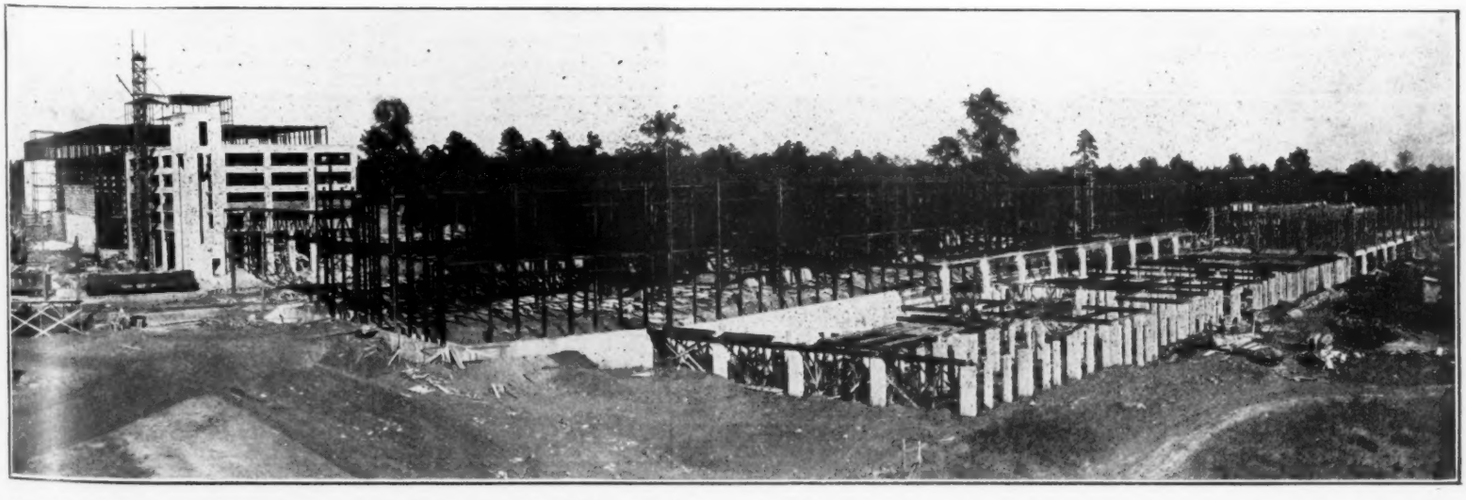
Knitting Mills

Pennsylvania and New York divide the honors on new knitting mills, having 15 and 14 respectively. Massachusetts and Connecticut follow with six apiece. On the whole gains have been chiefly in the outer wear field, and the hosiery and underwear groups have not been greatly added to. The outstanding new hosiery mill is that of the Theme Hosiery Co. at Los Angeles. A number of underwear mills added bathing suits and sweaters to their line, but this, it is said, required little change in their machinery.

Silk Industry

Progress in the silk industry was about on a par with the year before. There were no large new mills. New Jersey leads with six while New York and Philadelphia follow with four

(*Continued on page* 479)



General View of Buildings at Lyman, S. C., Plant of Pacific Mills; Bleachery at the Right, Cotton Storehouse in the Center, and Cotton Mill Building on Left

Southern Bleachery Nears Completion

Large New Plant Near Greenville, S. C., to Work on Fine Goods—Will Start With Capacity of 1,250,000 Yards Per Week But Lay-Out Will Permit Expansion to 3,000,000 Yards—To Generate Own Power —Developing Attractive Village for Employes

THE first plan announced for a new bleachery project during the present period of expansion in the southern industry was that of the Southern Bleachery, Inc., on the Enoree River at Taylors, S. C., about nine miles from Greenville. This plant, which will operate on fine goods, is nearing completion and is expected to start within a month or two.

If one relies upon the view from the railroad, a false impression of the size of this bleachery will be secured. It is a huge plant, 718 x 314 ft., reinforced concrete, daylight construction, with six acres of floor space and located on a site of 200 acres. The output at the start will be approximately 1,250,000 yds. per week, but the buildings call for a potential capacity of 3,000,000 yds. This mark may be reached without difficulty or without disturbing the continuity of the processes as space has been left for installing additional equipment in each department. The building is of reinforced concrete construction with Lupton steel sash and monitor roof.

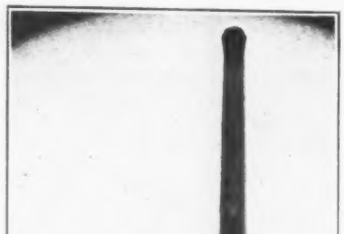
Gray Room

The gray room, 179 x 74 ft., will be equipped with two rotary sewing machines and one table machine, all supplied by the Dinsmore Mfg. Co.; the cloth will be drawn through brass pot-eyes which incidentally will be used throughout the mill. These pot-eyes are being made in the company's own machine shop. In the singe house there are two gas singers, supplied by the C. M. Kemp Mfg. Co.

Kier Room and Bleach House

The kier room and gray bleach house together measure 161 x 90 ft. There are eight 2-ton R. D. Cole kiers. Goods will pass through a gray sour before the boil, and there is an equipment of 16 cement bins to receive the cloth after this sour. There are four washers in this room.

All the equipment in the colored bleach house, which is 161 x 90 ft., will be built by the Southern Bleachery, Inc., in its own shop. This department probably will not be in operation before July. The white bleach house, about 80 x 190 ft., will contain two chemic washers, two sour washers and two white washers;



Power House of Southern Bleachery.

water squeezers and 38 cement bins for receiving the goods.

The mercerizing room, 156 x 81 ft., will be equipped with one range with 60-ft. frame at the start but has space for two additional ranges. Concrete bins are located at the delivery end.

Starch Room and Drying Room

The most impressive department in the plant is the starch room and drying room, 483 x 158 ft., one of the largest rooms in any bleachery in the country. Three 3-roll water mangles are located on either side to pull goods from either the white bleach house or the colored bleach house, while five starch mangles are located in the center. There are four sets of dry cans of 30 cylinders each. There will also be an installation of padders for dyeing of light shades.

The tenter room, 220 x 156 ft., has four 90 ft. frames equipped with Simpson winders. These tenters are equipped with the Boland cloth drying system made by H. J. Astle & Co., Inc., Providence, R. I. This consists of an individual dryer over all sections of the frame except the two end sections.

For the present the calender room and make-up room are located in a department 314 x 106 ft., adjoining the starch room. Eventually a second story will be added above this room to take care of these two processes. At the start there will be two sprinklers; one 6-roll calender, one 5-roll calender and two 3-roll calenders; also six Elliot & Hall measuring and folding machines.

A basement approximately 575 x 150 ft. will be used for a box making department and storage.

All the bleach house equipment and the water mangles are being supplied by the Textile-Finishing Machinery Co. The dry cans, starch mangles, sprinklers and tenters are furnished by H. W. Butterworth & Sons Co. The latter firm will also supply all the calenders except the 5-roll calender which will be furnished by the Textile-Finishing Machinery Co.

A separate building approximately 150 x 100 ft. will house the machine shop which will turn out the rolls, reels, pot-eyes, coils for tenters, and much other equipment needed in the plant.

Construction Details

All the floors, except in the gray room and part of the calender room, are of concrete. Copper skylights are used in the singe room. The support is by cast-iron pillars set in concrete.

A sloping platform on the outside of the building will enable easy transfer of goods from the second story make-up room when completed, to the loading platform. From a transportation standpoint the plant is ideally located, being between the tracks of the Southern Railway and the Piedmont & Northern.

Power Supply

The plant will generate its own power. The Enoree River runs not more than 100 yds. from the power plant, providing a supply of approximately 25,000,000 gallons per day. A narrow canal diverts the water to the raw water pump house.

There are four return tubular boilers furnished by the R. D. Cole Mfg. Co., Newnan, Ga., equipped with Elesco superheaters. There is also a 750 K. W. General Electric Co. 3-phase, 60-cycle turbo-generator of extraction type, steam being extracted at 40 lb. pressure. The power house stack is 175 ft. high, and 8 ft. 6 in. in diameter.

Driving of Machinery

With the exception of the tenters and sewing machines, which will be driven by individual motors, all the equipment will be group-driven by shaft motors installed in the different departments. All the motors are supplied by the General Electric Co. The lighting is direct, with R. L. M. reflectors and 200-watt bowl-enamelled lamps.

Water Treatment

For purposes of filtration and purification, there are two cement reservoirs, one a settling well with a capacity of 1,500,000 gallons, and the other a clear-water well with a capacity of 2,500,000 gallons. The filtration and purification equipment has been furnished by the Roberts Filter Mfg. Co., Darby, Pa. In addition, there are 10 artesian wells back of the filter house to supply drinking water to the mill and village.

The Village

The site lends itself well to an elaborate scheme of landscape gardening which is to be worked out by

Fine Goods Bleaching and Finishing Plant of Southern Bleachery, Inc., at Taylors, S. C.

E. S. Draper of Charlotte, N. C. The streets are curved, giving a parklike effect; and in addition space has been left for three actual parks, which will be carefully planted. Shade trees will be provided on all the streets but in many sections of the village there is a natural woods which will add materially to the general effect.

At the start there will be 30 4-room houses; 10 6-room houses; 10 5-room houses; and 6 8-room houses for the overseers. These are all of attractive design, exceptionally well painted, and equipped with bath, water, sewerage connection, and electricity. The village will be lighted by current purchased from the Southern Power Co. Plenty of space is available for expanding the village as required. A general store of brick has been constructed by the mill. An addition will be built to the Taylors grade and high school to take care of the additional pupils from the mill.

J. E. Sirrine & Co., Greenville, S. C., are the engineers for this development. The Gallivan Building Co., are the contractors, and Huntington & Guerry, Greenville, S. C., have the electrical contract.

The entire plant is a noteworthy addition to the textile industry of the South. The personnel of the organization is a particularly strong feature, being composed of men who have had successful experience at the Lanett (Ga.) Bleachery and Dye Works and at the Mansfield (Mass.) Bleachery. The officers of the company are H. R. Stephenson, president; Chas. C. Geer, treasurer; R. J. Stephenson, Jr., superintendent.

Bigelow-Hartford Plant, Thompsonville, Conn.

Capacity Increased by Large Additions to Worsted and Woolen Yarn Manufacturing Department, Brussels Weaving Mill, Axminster Mill and Dye House—Power Plant Reorganized and New Equipment Installed for Driving Additional Machinery and Meeting Process Steam Requirements

THE rapid growth of the Bigelow-Hartford Carpet Company's plant at Thompsonville, Conn., made it necessary to erect additions to several departments during the last year. These additions comprise an enlargement of the woolen and worsted yarn mill, extension of the Brussels weaving mill, a large addition to the dye house, a new Axminster mill, and changes and additions to equipment in the power house.

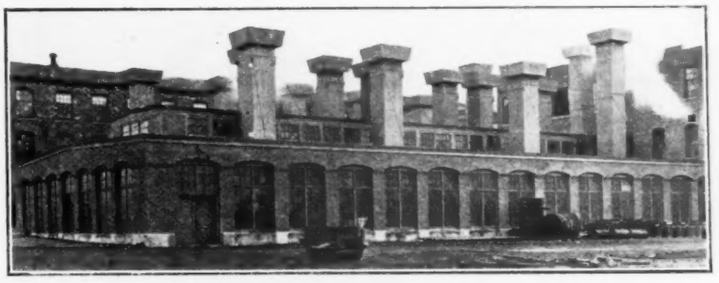
The first of the enlargements was an addition to the worsted and woolen yarn mill, consisting of a building 146-ft. long by 113-ft. wide, two stories and basement. The construction is slow burning, with steel floor beams, steel sash, and a monitor over the top story. The end of the old building where the connection was made was removed so as to make the rooms continuous. The old building is typical mill construction of several years ago, and the two types of construction being thus brought into close comparison give a very good idea of the advances which have been made. The building is equipped with sprinklers, modern steam heating facilities, and lighting.

There is an elevator serving all floors and the building is connected by a bridge to the adjoining building to facilitate the transportation of yarn to the gray yarn storage. The first floor is to be used for woolen cards and mules and the second floor for mules, skein winders and twisters. The basement will be used for storage. The machinery is electrically driven in small groups.

Addition to Dye House

The second addition was to the dye house and was designed to provide space for several new yarn kettles and some old machines which were to be moved to make room for additional yarn scouring. The building is 144-ft. long by 80-ft. wide, one story with monitor roof. There are three rows of kettles set over suitable trenches and arranged to give ample working spaces. The kettles are all individually motor driven, thus doing away with all shafting and belting.

The construction of the building is slow-burning mill construction with special care taken of the woodwork to prevent decay, and of all metal parts to prevent rusting. Provision was made to ventilate the room by a combination of hoods over the machines and the introduction of air into the room. The new dye house is now in operation and has been very successful. With the kettles in operation and with adverse weather conditions outside, the room is free of all steam and the men are able to work in a clear atmosphere with a relatively low humidity.



Addition to Dye House

The third addition consisted of a weave shed for heavy jacquard looms, which because of their weight and unbalanced action when in operation required a rigid type of building. The weave shed is 220-ft. long by 111-ft. wide, one story and basement. The main weave room floor is of concrete, using flat slab construction with a wood top. The roof is a steel frame sawtooth with plank on the slopes. There is only one row of columns, which are in the center of the building, and the resulting long spans required a special design to carry the sawteeth.

The walls of this weave shed are of brick with steel sash and the design provides excellent natural lighting for the looms, a particularly difficult matter with this type of loom because of the overhead equipment. The building is supplied with heating and sprinkler equipment and a combined system of lights for general and local illumination.

The basement is to be used for beaming and sizing and the first floor for jacquard looms from three-quarter to twelve-quarter. The looms are to be driven electrically in groups.

New Axminster Building; Another Section of This Mill is Now Under Construction

Axminster Building

The most recent and largest addition is a building 256-ft. long by 133-ft. wide, to be used for preparatory machinery, weaving and finishing of Axminster rugs. It is four stories high with a basement extending for 200-ft. of its length. The slope of the ground is such that this basement is for the most part well above the ground level and is well lighted. The construction is slow-burning with steel floor beams, steel sash and monitor roof. The lower stories are of extra height to provide space for the parts of the loom which are hung from the ceiling. The window area is large, permitting of unusually good natural lighting conditions. The building now completed is the first part of a larger development, the second section of which is now under construction.

A railroad siding runs across the end of the mill and stock can be unloaded directly into the basement. A freight elevator of large platform size and capacity serves all floors of the building. The heat is furnished by pipe coils hung from the ceiling and operated on a vacuum system. The power for the building is furnished by lead cables in a duct system direct from the power plant. The machinery will be driven in groups and individually by motors. The lighting will be both general and individual, according to the requirements of each department.

Power Plant Increase

At the time these additions were started the power plant was already overloaded and the added power and process steam that would be required in the new buildings were beyond the capacity of the plant. The existing boiler room equipment consisted of six water tube boilers and eight H. R. T. boilers, all hand-fired. Because of physical limitations it would have been difficult to enlarge the boiler house, and it was decided to remove the H. R. T. boilers and replace them with four large water tube boilers,

INDUSTRIAL BUILDINGS ERECTED PRIOR TO 1915

BALLING

If all the industrial and commercial structures designed and erected under Ballinger supervision were placed together, the result would be two cities of the size shown above, either of which would compare favorably with that of many a city holding a high place in the census report.

The Ballinger Company

PHILADELPHIA

S. E. Cor. 12th & Chestnut Sts.

It was then too late in the fall to consider removing any of the boilers before spring, and to assist in carrying the load during the winter hand stokers were installed on the old boilers.

As soon as conditions permitted in the spring, work was started, removing four H. R. T. boilers and installing in their place two 700 H. P. water tube boilers. After the new boilers were going, the operation was repeated. The existing stack is located in the center of the house and will have the new boilers on one side and the old ones on the other. The stack is large enough to take care of the entire installation. The new boilers are equipped with mechanical stokers, forced and induced draft, and modern ash handling facilities. Two turbine driven centrifugal boiler feed pumps were also installed and a large open feed water heater, into which the returns from the plant are dumped.

Small additions were made to the boiler room to house the new auxiliaries and also provide modern washrooms for the men. The old equipment in the engine room consisted of two 750 K. W. direct-connected engine-driven alternating generators operating at 600 volt, 40 cycle; one 1,000 K.W. mixed pressure turbine; one motor-driven 100 K.W. exciter set; one 75 K.W. engine-driven exciter set, and a 15 K.W., D.C. engine-driven night lighting set. The large units are operated condensing and arranged so that one of the engine units operates in connection with the mixed pressure turbine.

New Weave Shed for Jacquard Looms

A new 2500 K.W. extraction type turbine was installed with a specially designed condenser and auxiliary heater so that part of the condensing water is passed through the heater and the temperature raised with bleeder steam. This water is used for manufacturing purposes. A new 150 K.W. turbo-driven, 600 volt, 40 cycle generator was installed to furnish night lighting and power for night and week-end operation in the shops.

A new switchboard was also installed in a new location in the engine room and was connected to a new underground distributing system which feeds all the buildings in the plant. The old cable system was located in a tunnel with steam and water pipes, but it was already very much crowed and it was decided to remove all the cables and use it for piping only. New steam lines will be installed in the near future.

One of the difficult features of this work was the installation of a new intake chamber on the bank of the river with a pipe running out 60-ft. into the water. Two motor-driven, vertical centrifugal pumps were installed over the chamber to furnish circulating water.

This entire work was carried on with the plant in full operation and the power plant carrying some overload. It was necessary to carefully plan the various steps and time the operations so as not to interfere with the production of the plant. These various additions were designed and the work supervised by Charles T. Main, engineer, Boston.

Lyman Plant of Pacific Mills

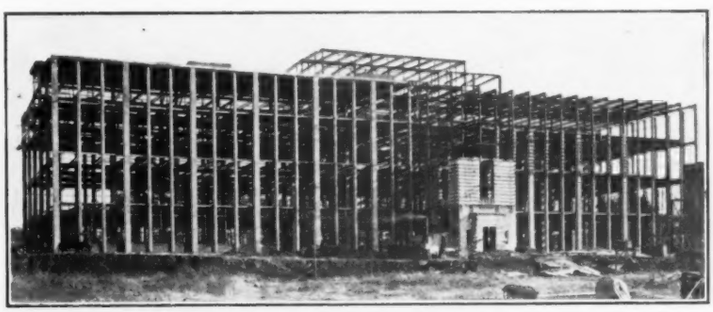
Development Includes Cotton Sheeting Mill, Bleaching and Finishing Works, Storehouse, and 305 Houses for Employes—Boiler Plant to Furnish Heating and Process Steam—Plans Provide for Future Extensions and Additional Stories on Bleaching and Finishing Works

By *S. B. Lincoln**

RAPID progress is being made on the construction of the large new plant of the Pacific Mills, at Lyman, S. C., near Spartanburg. The accompanying progress pictures taken on Dec. 1, 1923, give an idea of the character of the development, which comprises a wide sheeting mill, a bleaching and finishing building, a storehouse, boiler plant, and over 300 houses for the mill employes, with several community buildings. The total floor space of the plant, including cotton mill and storehouse, will be approximately 500,000 sq. ft.

The site selected for this plant lies along the main line of the Southern Railway between Spartanburg and Greenville, S. C., in Spartanburg County, about 11 miles southwest from the city of Spartanburg. The Piedmont & Northern Electric Railroad which passes through the property is a high-speed interurban line furnishing both freight and passenger service to about 132 cotton mills. The main highway between Spartanburg and Greenville passes close to the property. The site lies between 800 and 900 ft. above sea level, and the mountain ranges located about 20 miles away are visible from the site.

This plant is practically in the center of the gray cloth producing section of the South and is in the heart of the Piedmont section of the Carolinas. The new community has been named Lyman in honor of Arthur T. Lyman, a former president of Pacific Mills.



Cotton Mill to be Equipped with 32,000 Spindles and Accompanying Looms for the Production of Wide Sheeting.

Cotton Mill Building

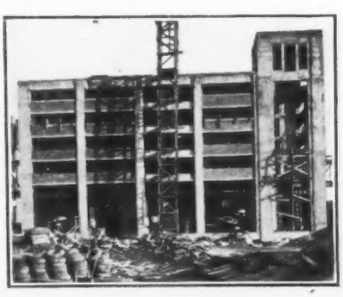
The principal manufacturing building will consist of a cotton mill to house 32,000 spindles, with accompanying preparatory machinery and looms, for the production of wide sheetings. The cotton mill has the entire skeleton of structural steel with both interior and exterior columns encased in concrete, so that the external effect is that of a concrete building. The cotton mill floors will be of plank and maple.

All of the cotton manufacturing processes will be contained in one building, including picker room and dust cellar. The looms will be on the second and third floors, with the spinning room on the top floor and the card room on the ground floor. An innovation in the construction of the cotton mill is the location of the fan room for the Carrier ventilating and humidifying apparatus on the roof of the building, with discharge duct of cement plaster construction extending vertically down through the center and branches running horizontally on the ceiling in each story.

A reinforced concrete storehouse, five stories in height, is being constructed for cotton storage. The opener room will be located in this building.

Bleachery Building

The largest structure being erected at the Lyman plant is the bleachery and finishing building, which will be about 600 ft. long by 200 ft. wide.



Front of Storehouse Building.

Part of this building is two stories in height, and part is one story and basement. The two-story portion is arranged for future extension to a total height of four stories. The entire building is arranged for a still further extension in two directions. The bleachery and finishing building will have over 300,000 sq. ft. of floor space. Among the initial equipment there will be 18 5-ton kiers equipped with Allen circulating system, supplied by William Allen Sons Co., Worcester, Mass.

The construction of the bleachery proper is of reinforced concrete walls, columns and roof, with working floor around machines constructed of creosoted timber and plank. The balance of the finishing plant is constructed with structural steel frame with exterior and interior columns encased in concrete, similar to the cotton mill building.

Boiler Plant

The boiler plant is being erected to furnish heating and process steam only, as electric power will be purchased from a public utility company serving this section. A large filter plant is being constructed on the Middle Tyger River, which runs through the property, and there will be filtering and pumping capacity sufficient to supply something over 2,000,000 gallons of water in ten hours.

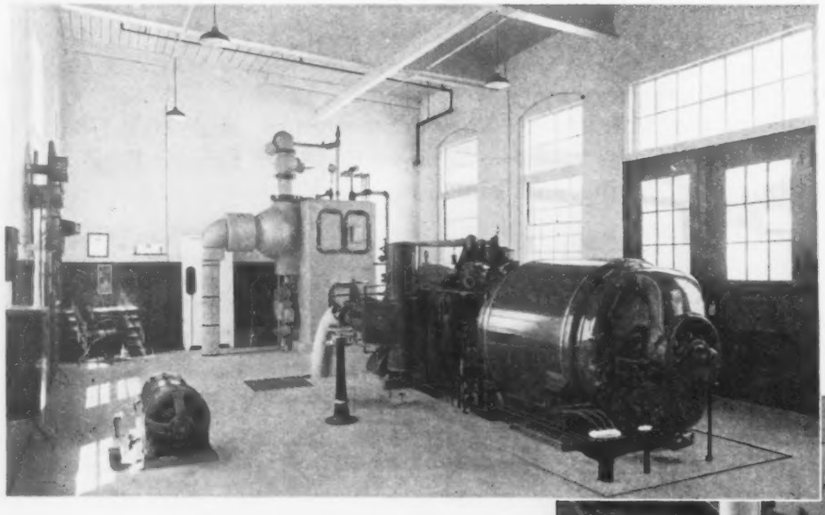
Three hundred and five operatives' houses are being constructed in addition to houses for superintendent and overseers. All these buildings are most attractive in design and will

*Locke, Greene & Co., Engineers, Boston.

Many Textile Mills Can Lower Power Costs

At all times efficiency in the generation, distribution and use of power constitutes an important item in textile mill operating economy. The cost of generating and distributing steam for manufacturing purposes is equally important in many mills.

The dyehouse is a large user of steam. An important economy can frequently be secured by combining the uses of steam for power with the uses of steam in the dye house.



Textile Mills
Industrial Buildings
Steam and
Hydro-electric Plants
Reports and
Investigations

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ENGINEER
200 DEVONSHIRE STREET
BOSTON, MASS.

Valuations for
Accounting,
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Purchase and Sale

compare favorably in character of construction and comfort of equipment with the best mill villages in the South. In addition to operatives' houses, there will be a 12-room schoolhouse and a community building. At a later date either one or two churches will be erected.

The plant is served by railroad connections from the Southern Railway main line and from the Piedmont & Northern Electric Railroad. Altogether about two miles of railroad track have been constructed to serve not only the present buildings, but also the buildings which may be erected at a later date. This development for Pacific Mills in its entirety has been handled by Lockwood, Greene & Co., engineers, Boston.

Sanford Mills Continue Building Program

New Five-Story Finishing Building and Four-Story Dye House and Spinning Mill Built During 1923 Provide 340,000 Square Feet of Additional Space for Processes—Reinforced Concrete Construction—Dye House Laid Out for Future Additions

By *E. K. Abberley* *

CONTINUING their building program of 1922, the Sanford Mills, located at Sanford, Me., completed during 1923 two reinforced concrete buildings. One of these is known as Mill No. 2 and is in their Mill "A" group of buildings. The other building is known as Mill "B" No. 3, and is in their Mill "B" group.

Following the precedent started in 1919, these new buildings are of reinforced concrete construction and are similar to the buildings erected in 1919 and 1922, as previously described in TEXTILE WORLD. They provide for a total of 340,000-sq. ft. of additional space, making a grand total of 800,000-sq. ft. of floor space in modern concrete construction, exclusive of weave sheds. It is interesting to note that with these new additions there is practically 1100 linear feet of modern mill in almost a straight line, flanked to the west with weave sheds.

Finishing Building

Mill No. 2 is 236-ft. by 80-ft. in plan, and five stories in height. It is located at the entrance to the mill yard. Interior columns are spaced about 20-ft. on centers, each way in the building. The exterior of the building is of concrete with Fisklock brick curtain walls and rolled steel sash, glazed with wire glass except for the lower rows of lights, which are glazed with double thick American glass.

The first floor is given over to washing, fulling and kindred processes. It is of concrete with a depressed portion to take the washers and fulling mills, the working space around these machines being at the main first floor level. The drainage from the machines is provided for and taken care of in this depressed area. The floor immediately around the machines is of creosoted wood plank, with removable sections to provide access to parts of machines below the floor. Machines are individually operated by electric motors. The second and third floors are given over to the handling of finished goods. On the fourth floor are Vento heaters, and ducts for tenters are located. The tenters themselves are on the fifth floor.

All floors in the building are of concrete flat slab construction with granolithic finish, except the first floor, as previously described, and the second floor, which has a maple finished floor. The roof is of plank on structural steel framing and is covered with a five-ply tar and gravel roof. The building is equipped with two electric freight elevators, sprinklers and modern plumbing and heating systems.

* New England Office, Turner Construction Co., Boston.

New Dye House

Mill "B," No. 3, as erected, is 114-ft. wide by approximately 439-ft. long, four stories in height. It is located in the center of the yard and is similar to the other new concrete spinning mills in appearance and lay-out except for the first story. This is laid out for washing and fulling, together with dyeing, and is most interesting in detail. The first floor runs through the building about level and is divided into three sections in the length of the structure. At the south end for a distance of four bays it has been laid out for beam dyeing. North of this for a distance of seven bays, for washing and fulling; and north of this for the balance of the building for the main dye room, which is approximately thirteen bays in length.

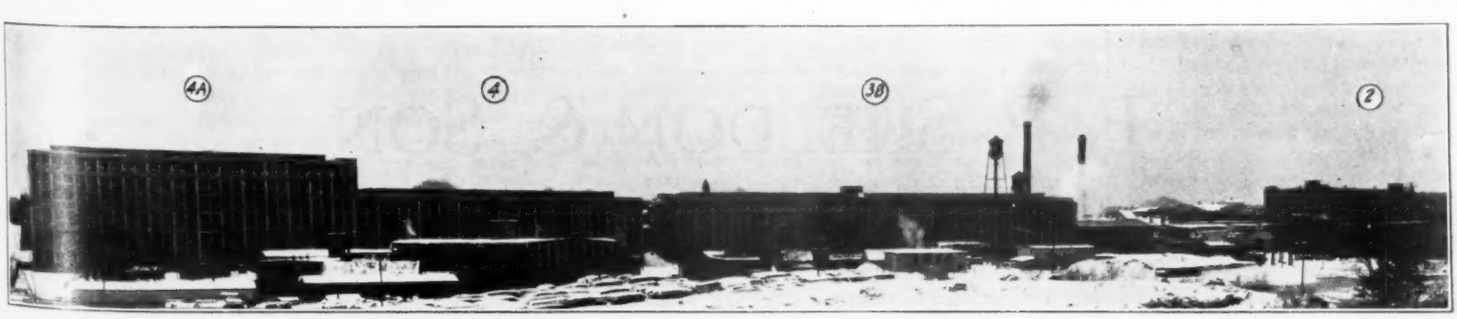
Under the beam dye room there is a basement in which foundations for the machines have been built, the machines themselves projecting up through openings in the first floor. The washers and fulling mills are supported on a concrete floor approximately four feet below the first floor level. The main working space is at the first floor level and is around the machines. The construction is quite similar to that used in Mill No. 2, previously described.

The main dye room construction is of especial interest. About four feet below the first floor level a self-supporting concrete floor was built on which the tubs are supported, the first floor being constructed with large openings to allow these tubs to project up through, the working space being at the first floor. Below this self-supporting concrete floor, another concrete floor was built on the ground, providing about four feet head room. The waste from the dye tubs is drained into this space, collected into trenches and finally disposed of in the main mill sewer. This space also serves as an exhaust chamber for all steam and other vapors so common in the dye room.

Hoods are provided over small groups of tubs, and ducts are conducted from these hoods down through the first floor and through the diaphram floor into this large exhaust chamber, which extends the full width of the building and the entire length of the dye room. The air in this space is exhausted by means of three large fans located around a central vent duct and is forced up through this duct to the roof. Fresh air is brought in from the outside through ducts connected to the outside steel sash. This air is heated by Vento coils and is blown into the room by fans.

The upper floors of this building are of beam and girder concrete construction, similar to those in the

New Building for Wet Finishing at Sanford Mills



Panoramic View of Recent Fireproof Construction at Sanford Mills, Sanford, Me. Mill 4-A, Built in 1922; Mill 4, Built in 1919; Mill B, No. 3, Built in 1923; Mill 2, Built in 1923.

New Dye House and Penstock of the Monument Mills, Housatonic, Mass.

Without Stopping a Wheel

ARE you confronted with the necessity of enlarging and remodeling an obsolete building, housing a process essential to the operation of your plant? The above photograph shows the remodeled Dye House of the Monument Mills at Housatonic, Mass., which was enlarged and rebuilt under our direction, without stopping the machinery, or interrupting production.

This problem may arise in any congested mill section, where the acquirement of more land is impossible, or where a change in the location of any unit would reduce the efficiency of the plant.

The successful execution of such a building program lies with the engineers and architects who design and plan the construction. In the case of the Monument Mills we were confronted with the additional problem of avoiding serious loss of light to nearby buildings.

A half-century of experience in designing industrial buildings of every type qualifies us to cope with your problems in construction. Write us for any information you may desire.

F. P. SHELDON & SON

ENGINEERS, ARCHITECTS, and APPRAISERS

PROVIDENCE, R. I.

present mill and are used for spinning and twisting, together with other miscellaneous mill operations. This building is sprinkled throughout, equipped with electric freight elevators and provided with modern heating and plumbing facilities. Construction work was started some time in the early spring of 1923, and machinery is now being installed.

This building is laid out for future additions to the north, and will bring it in line with the present finishing mill. A mill office is also contemplated in connection with this extension. It was necessary to install extensive pipe lines below grade to provide water supply for the dye room and washer room in this building. This water is brought from pondage back of the dam at the north of the mill yard, carried underground in cast-iron pipe lines and distributed to the various machines.

This work was carried out under the direction of George A. Clark, engineer, of Sanford Mills, Sanford, Maine. Mechanical layouts were provided by John A. Stevens, of Lowell, Mass. The buildings were built by the New England organization of the Turner Construction Co.

Farr Alpaca Cotton Yarn Mill Completed

Unusually High Type of Construction for New 70,000 Spindle Cotton Yarn Mill—Novel Features of Layout in Combination with Labor Saving Devices—Attractive Environment an Inspiration to Workers—Selective Conveying of Waste from Card Room—Machinery Painted Light Gray

THE plant of the Farr Alpaca Co., Holyoke, Mass., and its products, including mohairs, coat linings and dress goods, is known far and wide. This is the result both of the quality and quantity of the goods and successful merchandizing by an organization of unusual ability. Up to the time of building their new 70,000-spindle mill for the production of fine combed cotton yarns, the Farr Alpaca Co. bought all of their cotton warp and were one of the largest buyers of cotton yarn in the country.

Modernized Thoroughness

There has not been any discussion of items in the plant equipment except to bring out what was the kind desired, regardless of expense, within reason. But this does not mean that every device which could possibly save labor cost, to the last detail, was selected. For a consistent motive, based upon a new concept of the industrial aspect of the plant as a whole, has been followed throughout the project.

This motive, explained further on, has been accompanied by that equality of oversight in the selection of equipment details and layout of the machinery which brings forth the most from good quality and liberality in space, rather than experimenting with the extremes of radical changes. Such oversight might well be termed modernized thoroughness, as applied to this instance. And such thoroughness is a fitting complement to a sufficiently novel set of ideas which have guided the choice and limitations of labor saving equipment used here.

Fine Motive Carried Out

The analysis of the actual causes of labor dissatisfaction has brought many kinds of effort to overcome this undesirable condition. It is well known that wages alone are not the dominating consideration. For operatives repeatedly demonstrate that very common human desire to be happy and contented; also that they will not be contented when somebody else, receiving wages the same as theirs, has a job that is in some respects preferable.

To overcome this tendency to covet the job of another, and to eliminate the soreness which the inability to change places of operatives frequently brings forth in the factory, this admirable plant was to an extraordinary extent designed and organized, and with notable success. Such a motive, while not unknown, has probably never been carried out so thoroughly before. It might be styled an effort to achieve equable apportionment of labor to the large majority of the operatives.

Farr Alpaca Company's New Cotton Yarn Mill; Equipped with 70,000 Spindles.

Stimulating Appearance

A study of the organization layout, as well as details of the labor-saving equipment selected is well worth while. Such descriptive matter as follows can do no more than skeletonize an idea of a plant built around a simple motive, and carried through harmoniously. For it is an inspiring atmosphere, rather than mere neatness and order, which has given the environment of every operative the common denominator of a cheerfulness rarely achieved in a textile plant. And best of all, the whole project has been carried through on a concept available and within the reach of every successful organization seeking similar results.

For the question of the limitations of practical expense put into building materials and construction attractiveness is one with wide elasticity, under various conditions, while the question of the value of equable apportionment of tasks, and the common element of cheerfulness, is beyond the need of defense.

Machinery All Light Gray

A fundamental cause of the appearances and general effects just mentioned is the color of the machinery. It is all a light gray which, in conjunction with the gleaming mill white overhead, fills every room with a softened effulgence almost hitherto unknown in a plant of this kind. The effect is a wonderful improvement.

There has been a clean cut challenge to the idea of hiding greasy oil or dirt of any kind. In an industry where cleanliness is not merely desirable, but one of the indispensable factors of that kind of manufacturing done here, this challenge has been issued to every type of slovenly neglect.

Labor Saving Equipment

The approach to the problem of utilizing labor saving devices has been subordinated, as explained above, to the general plan of apportioning tasks in a rational manner. In doing this it was simply logical to eliminate certain forms of drudgery. But, of course, that does not mean that where a device could be employed to eliminate a whole operation or series of operations, it has been omitted in any instance merely to give work to somebody who did not have enough to do. But if the contemplated elimination of operations involved a large outlay, which could be obviated by balancing up the work of another operation by a change in layout, and the addition of a labor saving device of unquestioned value, then this combination was used.

The Basement Group

The opening equipment and pickers were made by Dobson & Barlow, including Creighton openers for optional use. In the waste room are placed the Howard & Bullough waste conveyors connecting with the Economy Baler Co.'s waste baling press through the medium of blower pipe and condensers. Here also are the receivers of the card stripping equipment, made by the Abington Textile Machinery Trustees.

To take advantage of this grouping, the storage of cotton was placed adjacent to the waste room. Also on the basement floor is a receiving area into which the bales of cotton are chuted from the railroad platform above. The result of this grouping eliminates expensive equipment for distribution over a large area, and cuts the actual work involved to a minimum. And yet the machinery and construction involved are of a high order without extravagance in any item.

Waste Room Storage System

The system is such that by means of simple methods all the waste in a 70,000-spindle mill is handled expeditiously, and is worth a moment's study. In the card room are a series of receiving uprights, placed over the conveyor belt, which is below the floor level, to receive the stripper waste, fly, or other waste from the carding room and conduct it to the waste storage bins. An electric switch, under lock and key, enables the carding room waste man to operate this signal system without interference from playful or malicious fellows. After unlocking the master switch, a push button lights a light in the waste room, indicating the kind of waste being sent down, and any other information desired.

This arrangement eliminates a long travel by waste men, and is so simple as to be beyond the troubles associated with greater complexities of handling methods. But it also relieves the card room of one of its most disagreeable jobs.

In the waste room, temporary storage is provided for the six or seven different kinds of waste, in storage rooms into which the conveyor from the card room delivers it. Doors allowing the delivery from the waste conveyor into the tops of these storage rooms, are opened from below by the waste room man, upon signal from the card room. Then when enough waste has accumulated for a bale, this is put through the condensers, from which the dust is carried away with the air, and the baling

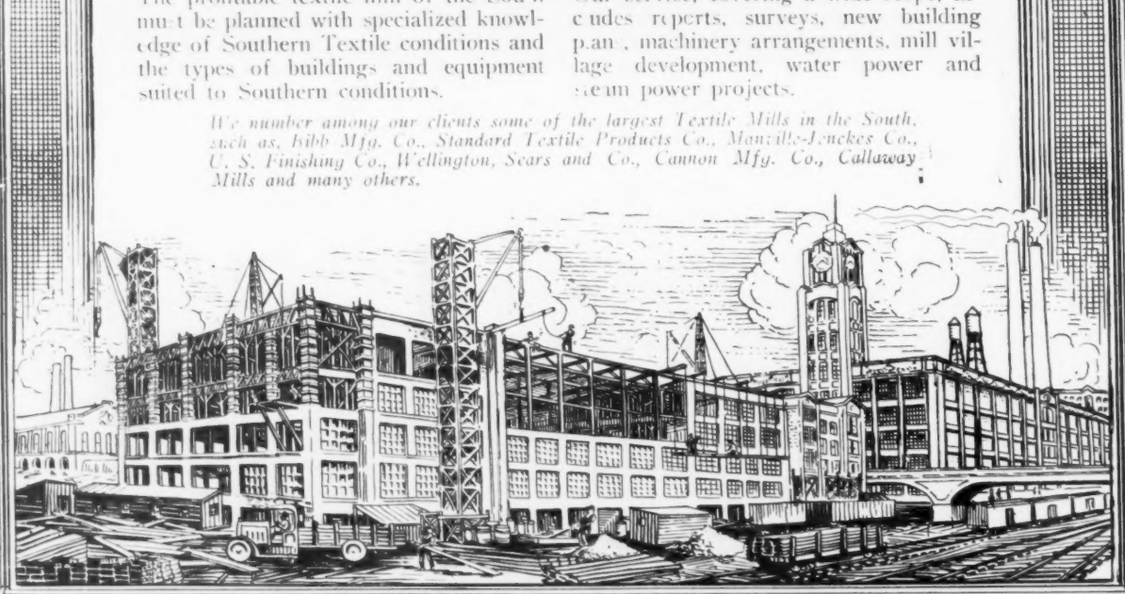
Birdseye View Showing 137,000 Spindle Columbus Plant of the Bibb Mfg. Co.

ERECT THE PROPER FACTORY

The profitable textile mill of the South must be planned with specialized knowledge of Southern Textile conditions and the types of buildings and equipment suited to Southern conditions.

Our service, covering a wide scope, includes reports, surveys, new building plans, machinery arrangements, mill village development, water power and steam power projects.

We number among our clients some of the largest Textile Mills in the South, such as, Bibb Mfg. Co., Standard Textile Products Co., Manville-Jenckes Co., U. S. Finishing Co., Wellington, Sears and Co., Cannon Mfg. Co., Callaway Mills and many others.



ROBERT AND COMPANY

INCORPORATED

ARCHITECTS AND ENGINEERS ATLANTA, GEORGIA

press filled. Dusted and baled, this waste brings a higher price than ordinary.

Storage for Opened Cotton

The storage room for the opened cotton has a novel feature in a latticed partition, built out from the fireproof walls, leaving space enough for a man to walk around the whole stored mass. This space assists aeration, and prevents absorption of moisture from cement walls, and a resulting increased dampness in the mass of cotton next to walls. Some objection was raised by insurance stipulations on this item, but it was insisted upon as of sufficiently great importance to justify its inclusion.

Humidifying and Ventilating

The humidifying system was furnished and installed by the Carrier Engineering Corp. and consists of four fans and air washers located in the basement. Each fan is driven by a 50 H. P. motor. For heating, ventilating and humidifying during the winter, two fans are used and four fans in the summer.

The air passes in concrete ducts under the basement floor to a concrete air shaft located at the center of the mill, rising to the top floor. Galvanized iron ducts attached to this shaft distribute the air throughout the length of each floor, dampers and heaters being supplied at the entrance of each duct. The heaters and dampers are automatically controlled from two points in each room, maintaining constant humidity and temperature. The picker and opener cotton bin rooms are supplied through separate ducts direct from the air shaft with automatically controlled heaters and dampers.

The system is guaranteed to maintain 70° temperature when the outside temperature is 10° below zero, to maintain humidity, regardless of the outside weather conditions, of 55% in carding room and 60% in all other departments; to cool the building in summer to a temperature not exceeding 17° above the wet bulb temperature of the outside air. The washers are guaranteed to remove not less than 98% of solid matter, except smoke, carried by the air.

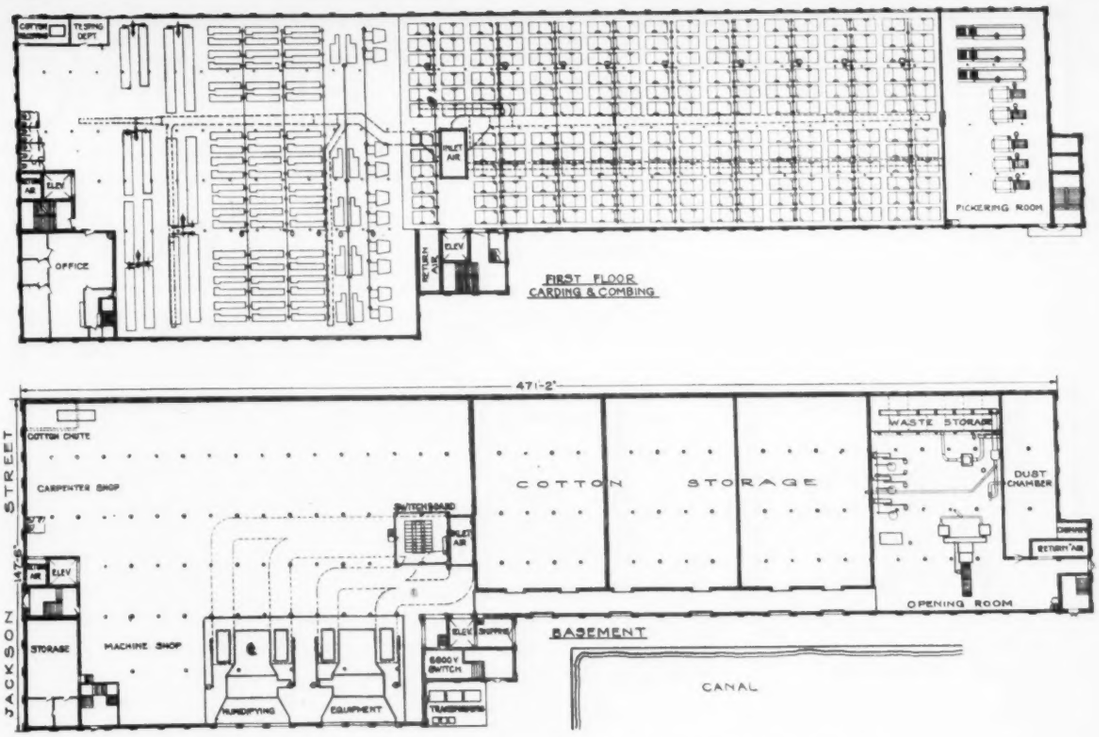
Sprinkling System

The sprinkling and hydrant systems were designed by the engineers and installed by the Holyoke Valve & Hydrant Co. The water supply is obtained from the city mains and also from fire pumps located at the dye house power plant. Each cotton storage room is controlled by individual valves and they are equipped with automatic alarms which operate if a sprinkler head opens.

Drinking water at 58° F. is supplied from an artesian well, the water being first delivered to drinking fountains located on each floor and then to a tank at the top of the center tower, from which the toilets are supplied.

Compressed Air Supply

Compressed air is furnished by an air compressor located in the basement and is piped to each floor so that motors can be conveniently cleaned. The machine and carpenter shop are located in the basement and are supplied with complete machinery for repair purposes. All of the machines have individual motors.



Plans of Basement and First Floor of Farr Alpaca Company's New Yarn Mill

The Electrical System

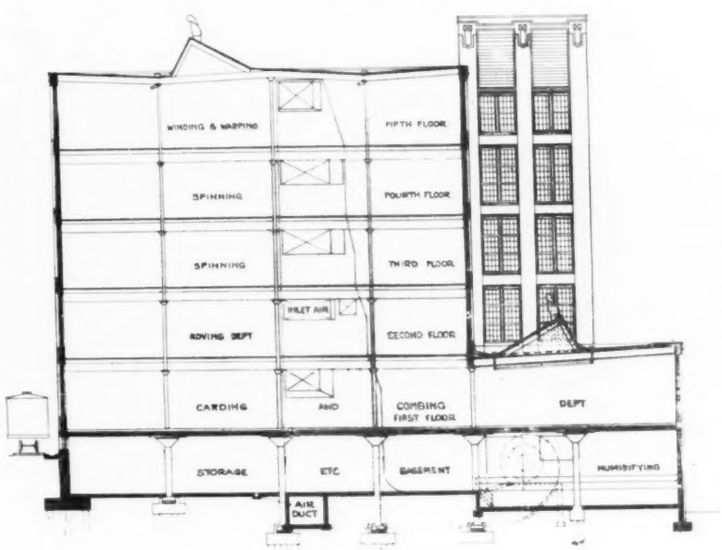
In the basement near the humidifying and ventilating system is located the control and meter board, having the master switches and meters for each of the twelve circuits installed. The regulation General Electric construction is to be found, but the unusual feature about this arrangement is provision for measuring the power consumed by each department. A moment's reflection will develop the reasons why a great and valued amount of information may be gotten from the readings of these meters. Any detail affecting power consumption in every department is clearly and accurately recorded. This is one of a great many similar evidences of the modern thoroughness, found here expressed in conservative progress.

The mill is electrically driven, the current and steam for heating being supplied from the dye house power plant, located across the street from the new plant. Current is transformed from 6,600 volts to 550 volts for power, and 110 volts for lighting.

The lighting of the mill is accomplished through the use of Novalux fixtures placed on 24 ft. centers, and has proved exceedingly satisfactory.

Department Layouts

It is inexpedient to detail every important item entering into the especially fine layout which this new mill possesses, but there are several general characteristics, which have been carried out in consonance with the motive dominating the whole concept of the plan, as explained above, which can be mentioned. First is noted the wide uninterrupted center aisle which runs through each room. Along with this feature giving accessibility to the whole length of each room for use of electric trucks, there is the arrangement of equipment having balanced lighting supply, both natural and artificial, and an almost complete bilateral symmetry, so that no operative could find one side of the room preferable to the other for working conditions.



Cross Section of Farr Alpaca Company's New Mill

Generous Floor Space

Supplementing the symmetrical and balanced layout of equipment is the provision for a generous amount of space around each machine. It is not to be expected that coats or trousers will be torn by licker-in belts or caught in gears when squeezing between machines during the days' work, for no squeezing is possible. There is room enough to walk all around every card, and nearly all other machines in the mill. This factor also facilitates cleaning and tending the machinery.

In conjunction with this feature, no piping is permitted to jut into any alley or passageway, either to obstruct the way or collect dirt, to the detriment of appearances. So that power floor scrubbers may be pushed along freely, and the daily work around the machinery is something more easily accomplished than usual.

Two lines of 24 cards are belt driven from a shaft, driven by a 25 H. P. motor through Link-Belt chain transmission with the chain running in oil. This has eliminated long heavy drives to the card driving shafts, and with the elimination of these belts has been prevented con-

FISKE-CARTER CONSTRUCTION CO.

GREENVILLE, S. C.

General Contractors

All kinds of Building Construction, Sewer and Water Installations, Concrete Roads, Bridges and Dams

We Give Below Partial List of Corporations and Individuals for Whom We Have Done Work:

Pacolet Manufacturing Co., Spartanburg, S. C.
Drayton Mills, Spartanburg, S. C.
Spartan Mills, Spartanburg, S. C.
Clifton Mills, Spartanburg, S. C.
Beaumont Manufacturing Co., Spartanburg, S. C.
Pelzer Manufacturing Co., Pelzer, S. C.
Clinton Cotton Mills, Clinton, S. C.
Piedmont Manufacturing Co., Piedmont, S. C.
Woodside Cotton Mills Co., Greenville, S. C.
Dunean Mills, Greenville, S. C.
Brandon Mills, Greenville, S. C.
Victor-Monaghan Co., Greenville, S. C.
Poinsett Mills, Greenville, S. C.
Nuckasee Manufacturing Co., Greenville, S. C.
Union Bleachery, Greenville, S. C.
Anderson Cotton Mills, Anderson, S. C.
Erwin Cotton Mills, Durham, N. C.
Durham Hosiery Mills, Durham, N. C.
R. J. Reynolds Tobacco Co., Winston-Salem, N. C.
Erlanger Cotton Mills Co., Lexington, N. C.
E. A. Smith Manufacturing Co., Charlotte, N. C.
Savona Mills, Charlotte, N. C.
Thrift Manufacturing Co., Charlotte, N. C.
Chesnee Mills, Chesnee, S. C.
General Asbestos & Rubber Co., Charleston, S. C.
Ware Shoals Mfg. Co., Ware Shoals, S. C.
Arcade Mills, Rock Hill, S. C.
Baldwin Cotton Mills, Chester, S. C.
Valley Falls Mfg. Co., Spartanburg, S. C.
W. S. Montgomery, Spartanburg, S. C.
Lexington Manufacturing Co., Lexington, S. C.
Eugene F. Bates, Greenville, S. C.
E. C. Holt, Burlington, N. C.
Clinchfield Mills, Marion, N. C.
Dover Mills Co., Shelby, N. C.
Inman Mills, Inman, S. C.
Gainesville Cotton Mills, Gainesville, Ga.
International Cotton Mills, Hogansville, Ga.
Dunson Mills, LaGrange, Ga.
Lowell Bleachery South, Griffin, Ga.
Opelika Cotton Mills, Opelika, Ala.
Alexander Sprunt & Sons, Charlotte, N. C.
Savannah Warehouse & Compress Co., Savannah, Ga.
Abbeville Cotton Mills, Abbeville, S. C.
Aragon Mills, Rock Hills, S. C.
Oakland Cotton Mills, Newberry, S. C.
Woodruff Cotton Mills, Woodruff, S. C.
Ralph Van Landingham, Charlotte, N. C.
Capt. Ellison A. Smyth, Greenville, S. C.
Victor M. Montgomery, Spartanburg, S. C.
Reed & Prince Mfg. Co., Worcester, Mass.
Worcester Buick Co., Worcester, Mass.
Samson Cordage Co., Shirley, Mass.
Coy Paper Co., Claremont, N. H.
Aspinook Co., Jewett City, Conn.
Woonsocket Rubber Co., Woonsocket, R. I.
Ipswich Mills, Gloucester, Mass.
National Fibre Board Co., Bar Mills, Maine.
William Underwood & Co., Boston, Mass.
Herald Machine Co., Worcester, Mass.
Stevens Linen Works, Webster, Mass.
A. J. Bates Shoe Co., Webster, Mass.
S. Slater & Sons, Webster, Mass.
Intervale Mills, Webster, Mass.
Quinebaug Mills, Quinebaug, Conn.
Boston Manufacturing Co., Waltham, Mass.
Clinton Wire Cloth Co., Clinton, Mass.
Ludlow Manufacturing Associates, Ludlow, Mass.
Bird & Son, East Walpole, Mass.
Boston Rubber Co., Malden, Mass.
Frank Partridge, Proctor, Vt.
American Steel & Wire Co., Worcester, Mass.
Carolina Supply Co., Greenville, S. C.
Southern Textile Machinery Co., Greenville, S. C.
E. Thomason, Charlotte, N. C.
Piedmont & Northern Railway, Charlotte, N. C.
Union Buffalo Mills, Union, S. C.
Riverside Cotton Mills, Anderson, S. C.
Sunlight Hosiery Mills, Blackville, S. C.
North Carolina State Highway Commission, Raleigh, N. C.

New Bleachery of the Ware Shoals (S. C.) Mfg., Co.
J. E. Sirrine & Co., Engrs. Fiske-Carter Construction Co., Contrs.

sider ble static electricity, and not a little obstruction of the overhead.

Ball Bearing Shafting

Ball bearings are used throughout on shafting bearings, in some instances the S. K. F. bearings, and on others the Fafnir. Most of the shafts are driven by silent chain drive enclosed in oil tight casings made by the Link-Belt Co., and it is felt that these fully pay for themselves in lessening maintenance and attendance costs, in addition to reducing danger and time consumed in cleaning overhead. In addition they pay a certain dividend in saving of power.

Cotton Equipment

The cards, drawing frames and speeders were built by Howard & Bullough, the lappers and combers by John Hetherington & Sons; spinning frames by Fales & Jenks; the winders by the Universal Winding Co.; and the warpers by the Saco-Lowell Shops.

The arrangement of the cards, drawing frames and combers is conventional, with a liberal use of floor space, but never making the distance excessive in moving cans about. One extra man alone handles cans in the mill, while the movement of cans from cards to drawing is done by the tenders of cards, and so on by each operative, till cans reach the slubbers. They are returned by the one man for this work. But in each instance, there is the careful apportionment of each job to maintain the common relation, mentioned above, to all other operations, so far as practicable.

The transmission of power from motors to the lineshafts which drive the ribbon lap machines and combers is by the Link-Belt chain, the combers being driven by quarter-turn belts. The drawing frames and slubbers are driven by four-frame and two-frame motor drives.

Elevators and Escalator

Two elevators, one at the Jackson St. side and one at the center of the mill, cooperate to keep stock moving. These elevators are made by the Otis Elevator Co., are of 6,000 lbs. capacity, and are equipped with Peelle safety doors at all openings. The platforms, 10 x 12 ft., are large enough for handling a good sized load at one time. At the other end of the mill, Otis escalators, of reversible type, are operated from the second story to the top floor to carry the workers back and forth.

Routing of Ribbons

The slubber bobbins are packed in box trucks, and are delivered by the elevator operator on the Jackson St. side of the mill, from the truck parking space at end of slubbers to the second floor, on which the intermediates, roving and jack frames are located across the mill. They are driven from shafting running lengthwise of the mill through quarter-turn belts. Each section is driven by an individual motor. From this room the bobbins are delivered by the center elevator operator to the third and fourth floors, upon which are located the spinning frames.

From the spinning room, the movement of bobbins is by way of the central elevator to the top floor, upon which are located the Universal winders. From these winders the yarn passes to the warpers, and is put into ball warps.

The relationship of the elevator operator's work to the routing of stock has eliminated all but a single can handler in the card room, and all the hand truckers.

East Side of Farr Alpaca Company's New Cotton Yarn Mill.

The Spinning Room

The arrangement of spinning frames is crosswise the long, lofty spinning rooms. There are a total of 232 frames of 304 spindles each. The tape drive and filling wind are used throughout. Each frame is directly driven by a 7½ H. P. motor.

A wide center alley runs the length of the spinning rooms on the third and fourth floors with a generous side alley on both sides of the rooms, giving a fine accessibility from all points. Cleanliness is the keynote of this, as of other rooms in the mill. The light gray of the machinery supplements this idea and helps to enforce it. Roving bobbins are carried on boards, with pegs to hold them upright, and this method saves a good deal in the line of sloughing off the ends of bobbins, as well as enabling a minimum of handling operations.

Winders Used

The one radical change in this mill from the usual procedure in converting yarn for warps from spinning frames to warping machines is the use of Universal winders instead of spoolers. The chief underlying causes of this innovation are, first, tension control possible from the standard speed; and second, ability to wind longer packages than would be possible with fine yarns on a spooler. Where the value of cotton is as high as it is today, and where the quality of the goods is required to be as high as those made here, there can be little doubt of the wisdom of the selection of this method. The combination of the filling wound bobbin and the fine tension at the winder go a long way to conserve the elasticity of the yarn for warping and weaving.

New Warping Creels

On the Saco-Lowell warpers used here a new creel is being developed, which bids fair to have an increasing value and application to warping from winder made packages on fine yarns. There is nothing spectacular about this creel, and its principles are exceedingly simple. The principal purpose has been to give as nearly as possible a straight line draw to the yarn, so that there is an approximately even tension on all the threads. This results in a creel in which the packages are merely slipped onto skewers, arranged with a slightly increasing elevation away from the head of the machine, and with a series of offsets in straight lines from the center line of the warper to give side clearance to the yarn strands. The yarn is drawn from the side of a straight wound package. The effect is to give even tension, prevent chafing and simplify the matter of warping from side-draw from winder packages. There are developments still in progress on this idea, in which Mr. Boys is cooperating.

Yarn Inspection Intensive

The inspection of warp yarns at both the winders and the rewarping is most intensive. At the winders, practically every coarse spinning piece-up is caught by the close-set slub catchers; while the operative at the warper maintains an uninterrupted vigil. No blemishes whatever are tolerated in the fabric and if one is found at the loom, after all these previous inspections, it has to be removed before weaving.

This mill is a fitting monument to the ability, confidence, and courage of an organization of not only able manufacturers, but also of equally good merchandisers. It shows not alone confidence in the future of New England as the home of high grade cotton manufacturing, but also that there are ways to maintain this position. The cost of the plant, ready to run, was under $40 per spindle.

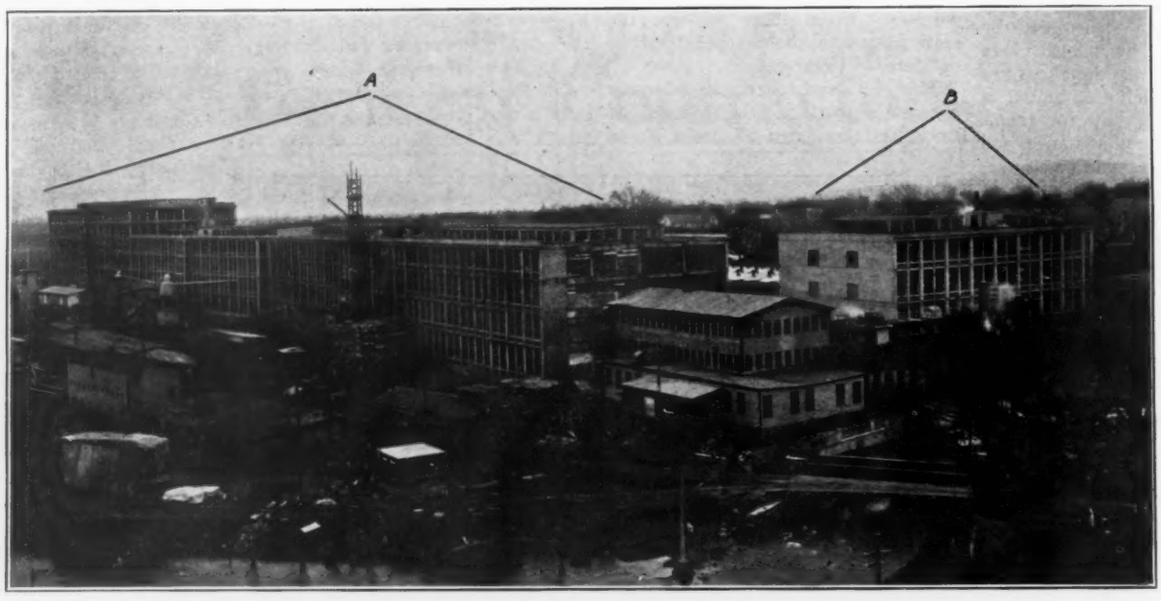
Construction work was practically completed and the installation of machinery was begun in May, 1923. The walls from the basement to the first floor are of reinforced concrete and the first floor is a reinforced concrete slab covered with plank and maple top floor, providing a fireproof ceiling for the basement and a solid floor for the card room machinery. The level of this floor is approximately car platform height. The concrete slab is of mushroom type. The concrete posts are on 24-ft. centers. The intermediate posts, carrying the upper stories, pass through the concrete slab without connection thereto.

The walls above the first floor are of brick encasing steel columns. The floors above the first floor are carried by steel I-beams resting on Lally columns designed so that the I-beams are held rigidly. The bays are 12 ft. wide and bents are of varying widths, arranged so that the columns do not interfere with the longitudinal aisles. The floors are of 4½-in. Southern pine and maple top floor with waterproof lining.

The roof is carried by Southern pine timbers supporting 3½-in. Southern pine plank. On top of the plank there is a layer of 1-in. corkboard and over this is applied five-ply tar and gravel roof. The corkboard effectively prevents condensation. The top floor is lighted by a sawtooth skylight. The basement height is 14-ft. 4-in. from floor to floor. All other floors are 16-ft. from floor to floor.

Samuel M. Green Co., Engineers, Springfield, Mass., designed the building, supervised the construction, purchased all of the construction material, specified the motor and transformer equipment, designed and specified the electric wiring, switchboard and sprinkling equipment, and let all contracts with the exception of the cotton machinery which was specified and purchased by the superintendent of the mill, Robert W. Boys. The engineers, in consultation with Mr. Boys, laid out the cotton machine equipment to meet the mill conditions.

Construction contracts were awarded by the engineers to Daniel O'Connell's Sons, Holyoke, Mass., for the brick work per thousand laid in the walls, for erecting the steel structure on a tonnage basis, and for all the rest of the work on a cost plus fixed fee basis. The engineers purchased all of the material and attended to its delivery f. o. b. Holyoke, the contractors taking the material from the cars and installing it in the mill.



SANFORD MILLS, Sanford, Me.

Spinning Mill "B" and Dye House--(A)

Mill "B" Finishing Building--(B)

In addition to the buildings shown we have built for these Owners a concrete Dye House, Finishing and Fulling Mill, two Weave Sheds, Turbine Building and Water Supply System.

TURNER CONSTRUCTION CO.

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Bleachery and Bag Factory at Ware Shoals

Installation of Finishing Machinery in Range is Most Interesting Feature at This New Plant—Two Ranges Installed, Each With a Theoretical Production of 100,000 Yards Per 10-Hour Day—Bleachery on Second Floor, Bag Factory on Third Floor—New Power Plant

NOT only is the new bleachery and bag factory at the Ware Shoals (S. C.) Mfg. Co. of interest because it furnishes additional evidence of the rapidly increasing diversification of the southern industry, but it is also worthy of note because of its installation of finishing machinery in range furnished by H. W. Butterworth & Sons Co., the latest development in this branch of textile manufacture.

The building itself is approximately 320 x 80 ft., 3 stories, reinforced concrete daylight construction. The bleachery is located on the second floor. At one end is the gray room, 25 ft. 8 in. x 80 ft. The cloth is drawn from the bale through a pot eye into the kier room, 24 ft. 10 in. x 80 ft. It goes directly into the wetting out machine, a 2-roll washer and from there into the kiers. There are four 4-ton Jefferson-Weedon kiers. From the kiers, the goods are delivered into a rope washer with a top rubber roll.

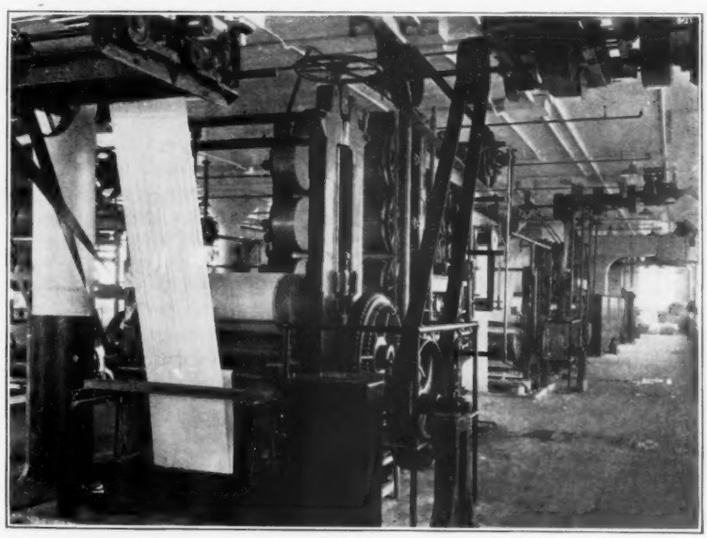
Then starts the first range. The cloth passes through a water squeeze; over a reel into the chemic pit; through another squeezer; then over a groove-pulley into three successive Gantt pilers, each with a capacity of about 3000 yds.; from the third Gantt piler back to another rope washing machine; through a water squeeze; into the sour squeeze; then through one Gantt piler; through the white wash, the machine having two rubber rolls providing a squeeze; then through another water squeeze; and finally delivered into the white bins, of which there are four, all of concrete.

Two Finishing Ranges

This marks the completion of the bleaching work and the beginning of the finishing, which is the most interesting feature of the plant since it is in range up to the calenders. There are two ranges in the Ware Shoals plant but as they are identically the same, only one will be treated.

The goods are pulled out of the white bins; through an overhead scutcher; over a 5-bar Mycock expander and through a 3-roll water mangle. This mangle has a 5-roll housing so that two more rolls may be added if it is desired to increase the weight. From the water mangle the cloth goes directly to a set of 20 drying cylinders, the first four being of copper and the remaining 16 of tin-steel. The goods then pass over a compensator, which equalizes any variation in speed between this and the next section of the range. At this point a folder is also provided so that it is possible to break the range here if desired and fold down the cloth into trucks.

From the compensator, the goods pass into a Tommy Dodd mangle for the filling operation and then up over a wooden drum set above the next set of dry cans. This wooden drum gives the necessary pull which cannot be obtained from the cylinders. The dryer consists of 30 cylinders, the first 10 being of copper and the remaining 20 of tin-steel.



Cloth Finishing Range at Ware Shoals Bleachery.

Passing over another compensator the cloth enters a 60 ft. tenter, provided with Foxwell guider at the entering end, and equipped with the Providence Ventilator Co. heating and ventilating system. The tenter is set in a Proctor & Schwartz housing. From the tenter the goods pass over two copper cooling cylinders; then over an atomizer or dampening machine, and are finally wound on a Simpson cloth winder provided with an automatic cut-off.

This marks the end of the range and the goods are ready for calendering. There are two 5-roll calenders, each provided with 5-bar Mycock expanders, and one arranged for chasing. These calenders are driven by a binder pulley drive from an Allis-Chalmers motor on the ceiling.

With the exception of the machines, the makers of which were specified above, this entire equipment was made and installed by H. W. Butterworth & Sons Co. of Philadelphia.

Motorization and Control

Naturally an important part of such a system is the method of driving the machinery and controlling the speed so that any variation which develops between the different sections of the finishing range may be automatically taken up. Briefly, this is accomplished by the Lewellen variable speed transmissions, driven by three 15 h.p. Allis-Chalmers motors and controlled by Westinghouse controllers.

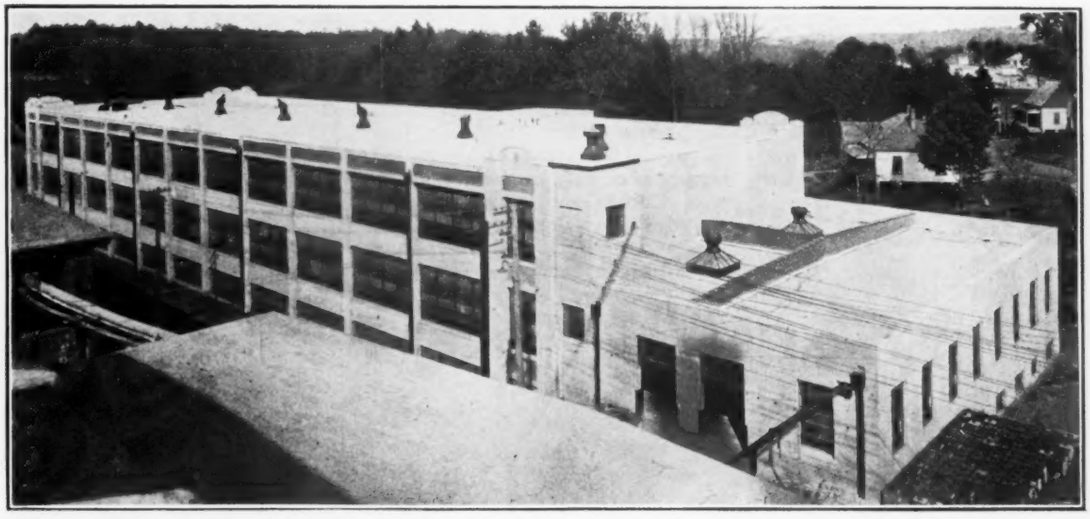
A motor-driven and motor-controlled variator drives by pulley to the water mangle at the beginning of the range and to the 20-cylinder dryer. The speed is varied by rheostat control connected with the dancing or floating roll of the compensator at the delivery end of the dryer. The Tommy Dodd mangle section is similarly equipped with a motor driven variator which in this case, however, is hand-controlled. This variator drives by belt to the Tommy Dodd mangle and the 20-cylinder dryer.

The tenter is equipped with a motor-driven and motor-controlled variator, connected with another compensator to control the speed of the tentering machine. In addition to taking care of speed variation, these compensators, in the case of a breaking of the cloth, are so adjusted that the floating roll immediately drops, hits a limit switch and stops the whole range.

In addition to the above equipment, the bleachery contains two size mixers made by J. H. Day Co., Cincinnati.

Bag Factory

The bag factory occupies the third or top floor of the building and has a capacity of 100,000 bags per day, which can be increased to 150,000 by the addition of equipment, since space is available for this extension. This department has six printing

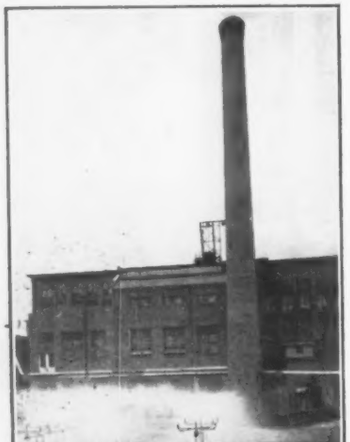


New Bleachery and Bag Factory of Ware Shoals Manufacturing Company.

presses, made by C. B. Cottrell & Sons Co., New York, with plant at Westerly, R. I. These are equipped with automatic cutter so that the machine cuts the cloth; prints it with the trade mark, name and description, as desired by the customer; and turns it inside out ready for sewing. These presses are run by individual General Electric Co. motors with automatic speed control. There are on this floor 36 sewing machines made by the Union Special Machine Co. driven in rows by a line shaft motor furnished by the General Electric Co. The other equipment in the bag factory includes two Economy baling prasses for compressing the finished bags.

First Floor for Storage

The first floor is used largely for storage but contains a room where the plates used on the printing presses are used. This equipment is furnished by the F. Wesel Mfg. Co., New York. In addition there is a job printing plant where all the forms used by the mill are produced and where outside work is also done.



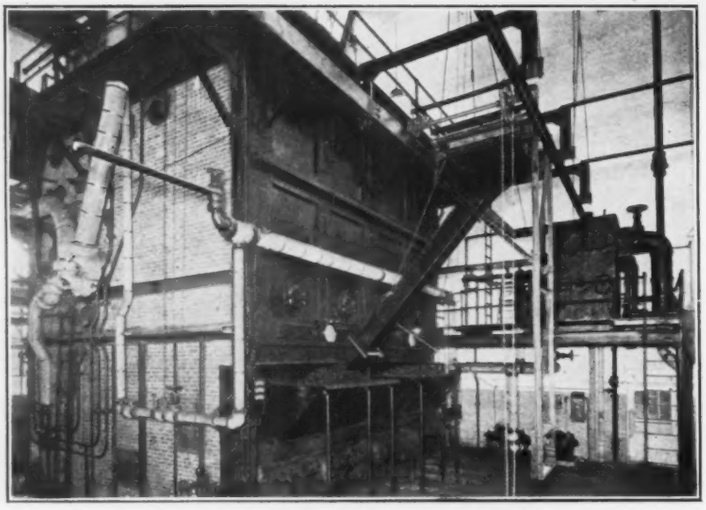
New Steam Power Plant at Ware Shoals Manufacturing Co.

At one end of the basement are the caustic mixing tanks from which the charge is pumped up for the kiers.

The support in the interior of the building is by means of concrete mushroom pillars. The floors, with the exception of those around the kiers and caustic mixing tanks, are of wood. The building is equipped with Newman's Patrol System. Grinnell sprinklers are used.

Cloth Conveyor

An improvement made recently at Ware Shoals which, while not an integral part of the bleachery construction, will have an important bearing upon the efficient operation of that plant, is the installation of an Alvey-Ferguson cloth conveyor. This consists of an endless belt, reversible, operated by individual motor. It takes cloth from the cloth room on the top floor of the main mill, conveys it to the top storage floor of the warehouse, whence it may be transferred by spiral gravity chute of sheet steel to any one of the floors of the warehouse, or to the shipping platform, or to the bag factory or bleachery in the new building. Furthermore, since the conveyor is reversible, the product of the bleachery or bag factory can come back by the same conveyor to the first floor of the warehouse or to the shipping platform. Incidentally the warehouse has had a two-story addition recently, and is now five stories in height.



Boiler Room of Ware Shoals Power Plant.

New Power Plant

In addition to its erection of a bleachery and bag factory, the Ware Shoals Mfg. Co. has completed a new steam power plant which operates in connection with the company's hydro-electric plant and is utilized for power purposes during dry seasons. In addition, this new plant supplies steam for process work in the bleachery and for heating and slashing in the mill. This new steam power plant is a model of efficiency, requiring only two men to operate it on account of the employment of coal-handling machinery and other labor-saving devices.

The boiler room, approximately 55x55 ft., contains two Stirling boilers, manufactured by Babcock & Wilcox, 501 h. p. each; Westinghouse under-feed stokers; Morris Machine Works motor-driven boiler feed pump; Worthington steam boiler feed pump; and Webster & Co., open-feed water heater with Lea V-Notch meter.

In addition, the company has installed R. H. Beaumont Co. coal-handling equipment and Baker-Dunbar-Allen ash hoppers. The boiler room floor is set 14 ft. above ground and the coal is brought into the boilers by this automatic coal handling equipment. The ashes are dumped into ash hoppers in the boiler and carried out on an industrial railway.

The Turbine Room

The turbine room is on the same level as the boiler room floor while the condenser room is on the same level as the boiler room basement floor. The turbine room is approximately 42x55 ft. There are installed a 2,000 K. W., 60-cycle, 600 volt General Electric Co high economy steam turbine; a C. H. Wheeler Mfg. Co. surface condenser, and a B. F. Sturtevant air washer.

The turbine generates current at 60 cycles and the hydro-electric plant generates power at 40 cycles, while the motors in the mill are all 40 cycles, with the exception of those in the new bleachery and bag factory. Consequently there has been installed in the condenser room a 2,000 K. W. frequency changer manufactured by the General Electric Co. The plan of the company is eventually to change to 60 cycles throughout their plant. The switchboard room, approximately 11x24 ft., contains a General Electric switchboard.

The company has installed an E. B. Badger & Sons spray cooling system for cooling and circulating the water. The stack of the new plant is 160 ft. high by 8 ft. in diameter and was erected by the Rust Engineering Co.

The new developments at Ware Shoals have been constructed under the direction of J. E. Sirrine & Co., engineers, Greenville, S. C. Fiske-Carter Construction Co. are the contractors.

The new bleachery and bag factory, the new power plant, new apartment houses erected by the Minter Homes Co, and the modern inn, all erected at Ware Shoals recently, have combined to make this already complete community, one of the most interesting textile developments of the South.

Dye House at Monument Mills

Combination of Reinforced Concrete and Modified Mill Construction for New Three-Story Building

DESIGNING and building a new dye house for the Monument Mills, at Housatonic, Mass., presented many interesting problems for the engineer and the contractor. There were two reasons for this: First, it was necessary to construct the new mill on the site of the old dye house without interfering with the operation of machinery; and second, on account of the conditions there was a limited and obstructed space in which to work. The old dye house was a wooden structure, part of which was one story and part two stories. Adjoining it was a brick building and another wooden building, which came within the area of the new dye house walls.

The new dye house is a three-story building, a combination of reinforced concrete and modified mill construction. The first story is of reinforced concrete, while the two upper stories are built with brick walls, steel floor beams, cast iron columns and plank floors. The first story of the building contains all of the bleaching, dyeing and drying machinery, and the ceiling is made of flat slab construction to facilitate ventilation. The new building is located comparatively close to No. 1 mill, so that the shading effect of the new three-story building on the lower floors of the present four-story mill was a matter to be considered in designing the new building. This objection was partially overcome by constructing the two upper stories some 14 ft. narrower than the first story.

Another interesting feature in

New Dye House of Monument Mills, Housatonic, Mass.

connection with this work was the construction of a reinforced concrete penstock approximately 400 ft. long, 12 ft. wide and 9 ft. 6 in. high, inside dimensions. This penstock is located under the one-story section of the dye house and the sides are designed to carry the walls of the building structure above. It was designed to sustain the hydraulic head of 35 ft., and was found to be perfectly water tight under these conditions. The possibility of cracks and lateral movements have been taken care of by the use of expansion joints.

As one of the most serious considerations in connection with this work was the continuity of operation of dye house machinery during construction, credit should be given to the contractors, Fred T. Ley & Co., and their superintendent, O. W. Miller, who had charge of this work. The dye house and penstock were designed by F. P. Sheldon & Son, engineers and architects, Providence, R. I.

Stark Mills, Hogansville, Ga.

New Three-Story Tire Fabric Mill of Reinforced Concrete Construction, Storehouse and Boiler Plant

By *J. C. Hipp, Jr.**

THE erection of the new plant of the Stark Mills, at Hogansville, Ga., was begun in June, 1923, and will be completed in the early part of 1924. This mill is a subsidiary of New England Southern Mills, which already have a plant located in Hogansville. The new mill is located about three hundred feet from the old plant and on the opposite side of the main line of the Atlanta & West Point Railroad. The location affords certain advantages both for construction and operation. The buildings consist of a main mill 550 ft. long by 130 ft. wide, three stories high, with basement 250 ft. long on the north end; a combined storehouse and picker building; a boiler house, and 129 houses for operatives.

The main mill building is a reinforced concrete structure. The storehouse and picker building is a standard slow-burning timber and brick building and is located in the rear of the main mill. The picker building proper is 90 ft. long by 70 ft. wide, two stories high, with dust room in the basement; while the storehouse is 70 ft. by 70 ft., four stories high. The former is connected to the main mill by a bridge at the second floor level. The boiler house is a brick building, 43 by 45 ft., with plank on steel trusses for the roof. It will house boiler plant equipment required for heating purposes only, as hydro-electric power for operation of machinery will be purchased from the Columbus Light & Power Co.

Enlarging Village

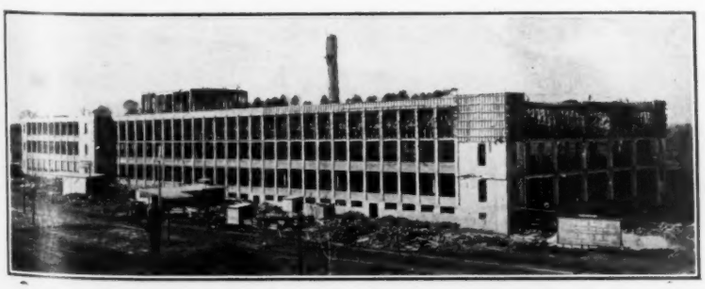
The present village will be enlarged by the addition of 129 houses for operatives. A complete waterworks system, taking its supply from a deep well, is being constructed to furnish service water and fire protection; a modern sanitary sewer system is being installed, and electric lighting is provided for the houses. The village already has a commodious community house and a modern school building so that the operatives will have the conveniences and benefits of an up-to-date city. The houses are well built and attractive, and are located on lots 70 ft. by 150 ft. deep. The streets are laid out 40 ft. wide.

The Stark Mills will have 35,000 spindles and will manufacture tire fabrics. The plant will employ 325 operatives and will use 150 bales of cotton per week. The mill is being equipped with a central ventilating and conditioning system which will supply and circulate fresh, clean air at uniform temperature and with suitable humidity to the various departments.

The A. J. Krebs Co., of Atlanta, Ga., are the contractors for erection of the concrete mill structure. W. P. Francis of Atlanta has the contract for the general construction work, including the storehouse, picker building, boiler house, transformer house and the wood floors and brick spandrel walls in the main mill. The steel sash were furnished and erected by David Lupton Sons' Co.; the freight elevators by the Reliance Elevator Co., of Chicago; the central heating and humidifying system by the Parks-Cramer Co., of Fitchburg, Mass.; and the elevated steel tanks (one 50,000 gal. and one 100,000 gal.), and boilers by the R. D. Cole Mfg. Co., of Newnan, Ga.

The LaGrange Lumber & Supply Co., of LaGrange, Ga., has the contract for building the operatives' houses; A. D. Branfield, contractor of LaGrange, Ga., is installing the waterworks system; and the Rockwood Sprinkler Co., of Atlanta, Ga., have the contract for the sprinklers and fire protection system for the mill. Lockwood, Greene & Co., are the engineers for the project.

* Lockwood Greene & Co., Atlanta, Ga.



New Tire Fabric Plant of Stark Mills at Hogansville, Ga.

Large Addition to Arcadia Mills

Designed With View of Future Increase—Mill Village Extended and Old Section Modernized

THE cotton manufacturing company known as the Arcadia Mills, located in Arcadia, Spartanburg County, S. C., five miles south of Spartanburg, on the Southern Railway, was founded in 1903 by H. A. Ligon and others. Beginning with 12,000 spindles and 200 looms and a capitalization of $200,000 the plant has been enlarged until at present it is capitalized at $1,000,000 and contains 34,000 spindles and 850 looms making print cloth and pajama checks. In May, 1923, work of building Mill No. 2 was begun under direction of Lockwood, Greene & Co., engineers. The main building is 280 ft. by 100 ft., three stories high, standard brick construction. The floor beams and columns are of steel and cast iron, while roof beams are of wood surmounted by a monitor the full length of the building. Weaving will be located on the first floor, card room on the second floor, with spinning occupying the third floor.

A three-story brick and concrete building connected to the main mill by an enclosed passageway at each floor is located at the rear of the mill. This building, 78 ft. by 50 ft., is to contain cloth room and shipping room on the first floor, pickers on the second floor and slashers on the third floor. The connecting tower is to contain an elevator and one toilet room on each floor, with another elevator located in the tower at the west end of the main mill. Toilets for the main mill are located near the center of the tower at the north side of the mill.

Additions to Arcadia Mills, Arcadia, S. C.

A four-section cotton warehouse, each section 50 ft. by 100 ft., is located in the rear of the mill and is served by a spur line from the Southern Railway main track. This spur also takes care of the shipping platform located across the track at the entrance to the cloth room. A brick and concrete boiler house, pump room, etc., are located convenient to the main mill buildings. Steel sash throughout with pilasters as small as good construction will permit insures a maximum amount of daylight for this type of construction.

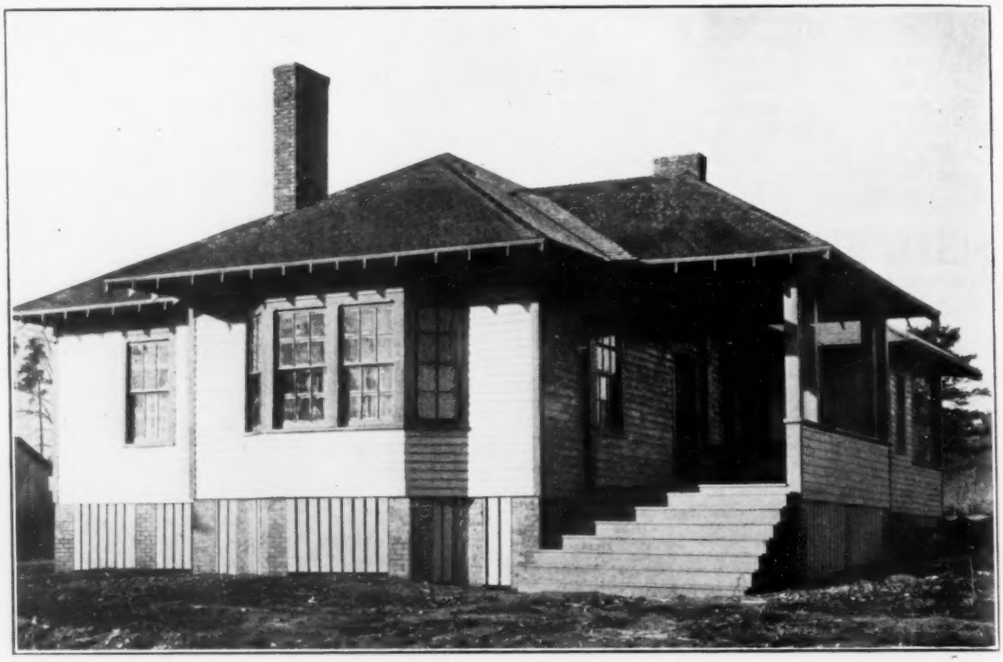
Designed for Future Addition

The present building is to contain 20,000 spindles and has been designed with a view to doubling its capacity at some future date. The location of the building containing cloth room, slashers and pickers, at what will eventually be the central section of the mill is worthy of notice as this arrangement permits an extension to the mill building without interruption of production, and also insures a minimum amount of trucking of stock in process and finished goods. Heating will be by branch coils while the required humidity will be furnished by a standard head with motor driven fan.

Drives will be for the most part in groups, individual drive being applied only to pickers. All light and power wiring will be in conduit with underground cables from transformers to a switchboard located in a room adjacent to the connecting tower between buildings. The opening room, located in the warehouse block opposite the picker room, is equipped with vertical opener connected in tandem with Murray opener, which insures a flow of clean cotton to the distributing system in the picker room.

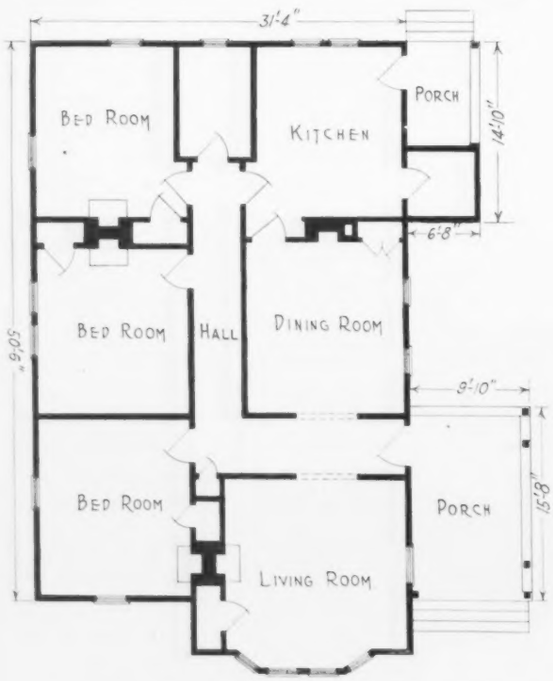
An extensive addition to the village has been completed and the engineers have begun the installation of complete sewerage and water systems in the original village.

Type of Minter Home in the Village of the new Southern Worsted Corp., Greenville, S. C.



Lockwood, Greene & Co., Boston, Mass., Engrs.

The Minter way is the modern way. We offer textile mills a complete contract blanketing the erection of employes' cottages, schools, community houses, churches, etc. Your architect's plans or your own plans can be Minterized with ease. Our complete contract appeals to textile mill executives. We can save executives' time and stockholders' money. We are able at present to give prompt delivery on all types of Minter Homes and handle their erection with our own experienced foremen and labor.



Floor Plan of Employe's Cottage in Village of Southern Worsted Corp.

You Get Action

Most delays on construction contracts can be avoided by careful advance planning. Our business is systematized. We can give you action on housing contracts entrusted to us. Your houses will be ready for occupancy when promised. It is significant that the people who are most familiar with Minter Homes buy most of them. In the City of Greenville and its suburbs, we can point to 778 Minter Homes of all types erected in a little over two years for the people who know most about the Minter System of Building and the prompt erection service we give on our contracts.

We want to quote on the houses you need.

The Minter Homes Co.

Greenville, South Carolina

Minter Homes Corp.

Huntington, West Virginia

Four New Buildings for Carpet Company

As Part of Extended Building Program, Alexander Smith & Sons Carpet Company Erect Four-Story Building for Mechanical Department to Consolidate Shops Under One Roof, Six-Story Designers' Building in Tapestry Mill Section, Yarn Drying Building and Large Garage for Trucks

DURING the last year four new buildings were completed by the Alexander Smith & Sons Carpet Company at their plant in Yonkers, New York, as part of an extended building program which this company has been carrying out for several years.

In some ways the mechanical building is the most interesting of these enlargements. It was constructed in order to consolidate all maintenance, equipment and plant repair work under one roof to give greater facilities to this very important part of the modern textile mill. The various subdivisions of the mechanical department are always more or less interrelated, and under the isolated shop arrangements existing at this plant and commonly found in textile mills of large size, much time is lost in carrying work from one department to another and the men going back and forth. The new mechanical building is a recognition of the growing importance of the mechanical department to the textile mill. Incidentally the erection of this new building allows for the vacating of smaller and obsolete buildings that have housed divisions of the mechanical department up to this time, and these may later be torn down to make room for still further new construction.

In general the new mechanical building is shaped somewhat in the form of a capital letter L, fronting 202 ft. on Lake Avenue and 240 ft. on Sawmill River Road where the building conforms to the bend in the street. The construction is of reinforced concrete throughout with the exception of the curtain walls which are of brick. The floors are of the flat slab type with the two-way system of reinforcement and are designed for a live load of 200 lbs. per sq. ft. A typical bay is 20 ft. sq. and the story heights are 15 ft.

Designers Building of Alexander Smith & Sons Carpet Company

Concrete 16-Truck Garage

In the rear and just to the north of the mechanical building is the new truck garage, a one-story structure 71 by 100 ft., constructed with concrete walls and columns and structural steel roof framing with a concrete roof slab. A 6-in. terra cotta tile partition divides the building longitudinally and each side is in turn subdivided by tile cross partitions so as to form a total of eight separate compartments with a capacity of two cars each. As each one of these compartments is equipped with two rolling shutter, steel doors, any one of the sixteen trucks may be taken out or brought in without any necessity of shifting other trucks and the consequent delay which is only too common in many garages.

Designers' Building

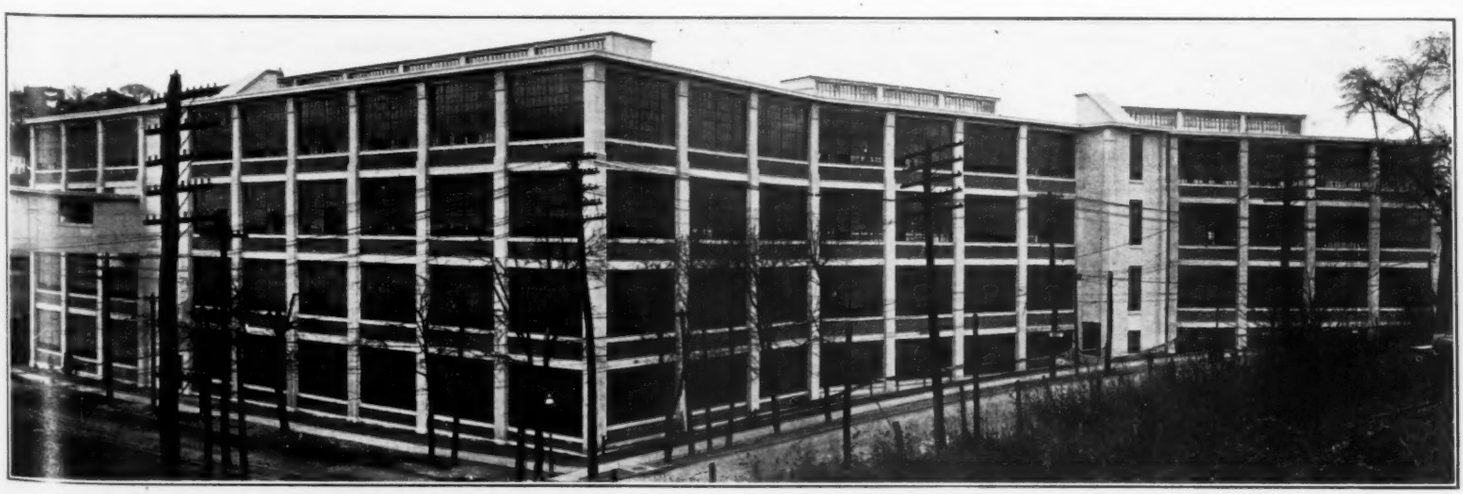
The new designers building in the tapestry mill section of the Alexander Smith plant is used as a drafting and designing studio in which designs, patterns and color combinations are worked out. Excellent light is provided with every convenience for the skilled work carried out in this department. The building covers an area of 43 by 102 ft., is six stories and basement in height, and is of the flat slab type of design with 12-foot story heights.

In order to obtain good light the curtain walls were constructed only 2 ft. 4 in. high and Campbell double hung metal sash were used. A typical bay is about 21 ft. sq. but the exterior columns are about 11 ft. on center. This was done partly to provide a window mullion and partly for architectural effect as the floors are divided by partitions or screens into designing rooms or booths about 11 ft. wide. This feature was also a determining factor in deciding on the spacing of the exterior columns.

An elevator, stairway and toilet rooms are grouped at the front end of the building with an emergency outside steel stair at the rear. The elevator is of the automatic levelling device, push button control type, as designed and installed by the Otis Elevator Co. This type of elevator does away with the necessity of an operator and affords convenient and quick communication between floors.

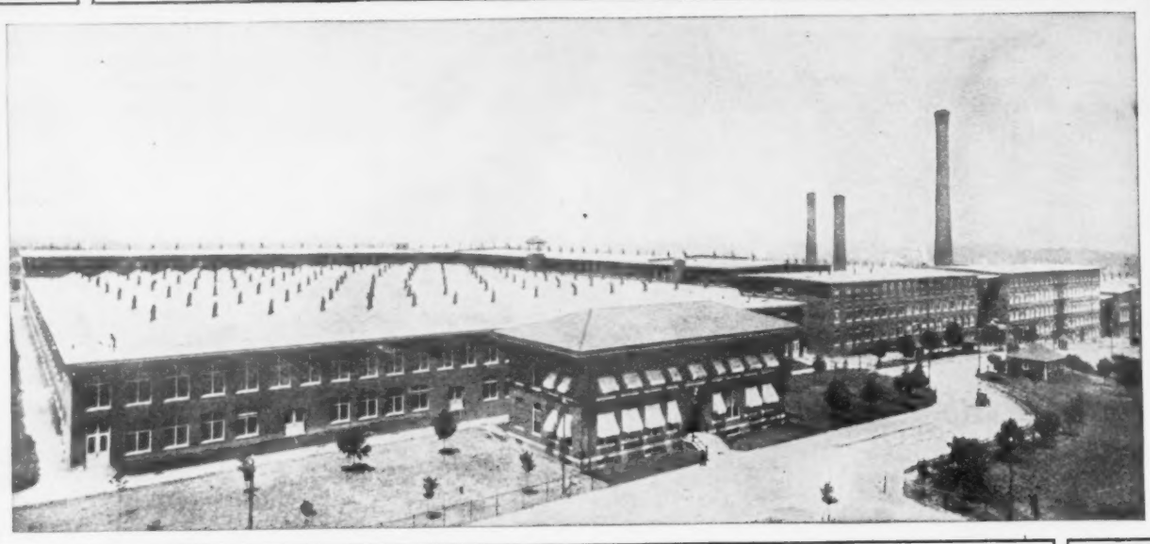
The extension to Building No. 9 consisted principally of foundation, floor and roof in a yard area between existing buildings and practically all the enclosure walls were formed by the walls of the adjacent buildings.

The work on all these buildings was carried out under the direction of Alexander Smith & Sons Carpet Co.'s engineering department, and the builders were the Turner Construction Co., New York. The Turner Construction Co.'s contract included all the mechanical subcontract work, except the electric wiring.



Mechanical Department Building of Alexander Smith & Sons Carpet Co.; All Maintenance, Equipment and Plant Repair Work Consolidated Under One Roof

Southern Yellow Pine Standard Mill Construction



Riverside & Dan River Cotton Mills, Danville, Va.
Lockwood, Greene & Co., Inc., Boston, Mass., Engineers.

The Economical Building

"Slow Burning" or "Standard Mill Construction" is approved and sponsored by Fire Insurance Authorities. It is just as free from fire danger and, in many cases, is more permanent than the most expensive buildings of other materials, with the added advantage of economy.

Southern Yellow Pine possesses the qualities that make it predominant as the safe, rational and cheap construction material for mills, factories and warehouses. It possesses the strength to stand excessive strains or shocks without collapse; by visual inspection its defects can be determined at a glance, without expensive investigation or tests; its density, hardness and strength, combined with a natural resinous filler insure minimum shrinkage and maximum durability; it lends itself to speed of erection and flexibility of repair, alteration or replacement.

Acknowledged as one of the standard and most reliable materials for mill, factory and warehouse construction, the use of Southern Yellow Pine means a saving of 10 to 25 per cent, as a conservative estimate depending on locality. Though cheaper, the Standard Sprinklered Mill Construction Building is a safe risk both as to building and contents and carries minimum fire insurance rates.

Before making a decision on your new building, consult our Engineering Department.

Please Address Dept. 122

This is one of a series of advertisements on the use of Southern Yellow Pine in Standard Mill Construction.

Southern Pine Association

NEW ORLEANS LOUISIANA

Mayflower Mills, Weaving Unit at Cramerton

IT is not possible to write in any final way of the new developments at the Cramerton (N. C.) Mills, Inc. It is true that operations have actually started at the Mayflower Mills, the new weaving unit of this organization, but the plant in its present stage of completion is merely one phase of a broad program projected for a period of years and destined eventually to result in one of the finest and largest manufacturing organizations of the country.

Thus far, buildings actually completed include a weave shed, with 500 looms installed, and a dye house and head house, which is of sufficient capacity to take care of the dyeing, bleaching, winding, warping and slashing for 2,000 looms. This is, of course, in addition to the Mays Mills, the original unit of the Cramerton Mills, Inc., containing 60,000 ring spindles and 20,000 twister spindles, for the production of fine combed yarns.

The Broad Plan

So much for accomplished fact. These figures should, however, be contrasted with those given to a representative of TEXTILE WORLD by Stuart W. Cramer, president of the company. The eventual plan is for an organization aggregating some 4,000 to 5,000 looms and 200,000 to 250,000 spindles, with adequate auxiliary preparatory and finishing machinery. In other words, the company's holdings of approximately 3,000 acres in Cramerton, now containing a village of about 3,500 people, is eventually to be a village of 10,000 people.

Naturally this cannot be realized in a year or two. This program points years into the future. The first goal is a total of 2,000 looms, and is planned to be reached by additions of 500 per year.

The Product

The product of the Mayflower Mills is to be a full line of fancy cotton dress goods and shirtings, plain and mercerized, and decorated in cotton, wool and silk. Finished dress goods, made at the mill and carrying the new trade name "Felicien," have already made their appearance on the market and have attracted favorable attention. Galey & Lord are the selling agents.

Details of Construction

The new buildings completed thus far are of brick, reinforced structural iron work, daylight construction with metal sash. The dye house and head house contains three stories, basement and sub-basement, about 80 x 230 ft., arranged for future extensions.

On the top floor are located the warping, beaming and slashing. The beamers and warpers installed are all from the T. C. Entwistle Co., Lowell, Mass.; and slashers are from the Saco-Lowell Shops, Boston.

On the second floor are the quilling and winding operations. There is also provision on this floor for the location of the silk preparatory processes at a later date. Quilling machines, have been furnished by the Whitin Machine Works, Whitinsville, Mass.; and winders by the Universal Winding Co., Boston. An interesting feature on this floor is the provision of cabinets along the wall for storage and proper care of the filling yarn.

Both long and short chain dyeing and Franklin package dyeing are provided for on the first floor and basement; also color mixing room, offices and laboratory. The bleaching and chain dyeing machinery was supplied by H. W. Butterworth & Sons Co., Philadelphia; the package dyeing equipment by the Franklin Process Co., Providence, R. I.; and the package yarn dryers by the Grinnell Co.

The Weave Shed

The present weave shed, equipped with 500 Crompton & Knowles automatic looms, with dobby attachment, is single story, approximately 135 by 280 ft. and is arranged for future extension. The building is remarkable for its excellent lighting. It is interesting to note that the company, having used sawtooth construction on its original plant, has switched to all glass and metal sides, with the roof raised to a 20-foot pitch in the center. The steel sash was supplied by the Truscon Steel Co., Youngstown, O. The floor of the weave shed is tar-concrete.

The looms and all other machinery are individually driven by General Electric Co. motors, the power being supplied by the Southern Power Co.

Plans for Finishing

As stated above, the goods woven at the Mayflower Mills are at present inspected, burled, sheared and singed, and then sent to the Aberfoyle Manufacturing Co. for wet finishing. The company has under way the erection of its own complete finishing plant, three stories and basement, 80 by 200 ft., as an extension to the head house, thereby throwing the dyeing and finishing into one department.

One of the most novel features of the construction of the Mayflower Mills is a tunnel 10 ft. high and 5 ft. wide, running underneath the entire plant and containing all the piping, wiring, sprinkler mains, fuse-boxes, etc. The object of this unusual arrangement is to eliminate the cluttering of the mill with these pipes and wires; and to concentrate them in one place where they will be easily accessible for repairs.

Another departure has to do with the mechanical handling of goods in process. The keynote of the plan is simplicity. Specially constructed trucks will carry the yarns to the head house where they go at once to the scales before entering process.

Electric trucks and conveyors are to be used for the transportation of the finished goods to the finishing plant; the cloth will also be taken in these trucks from cloth storage on the top floor of the finishing plant and dropped down in an elevator to a tunnel 12 ft. wide and 14 ft. below the floor of the weave shed, thence to a loading building about 15 by 50 ft., provided with enclosed platforms and equipped for the loading of three cars at once. In this way the goods are not touched by hand from the time they leave the finishing plant until they are unloaded in the cars.

Power House

The power house which supplies heat and process steam is approximately 50 by 60 ft., and contains two Walsh & Weidner tubular boilers with provision for accommodating three more.

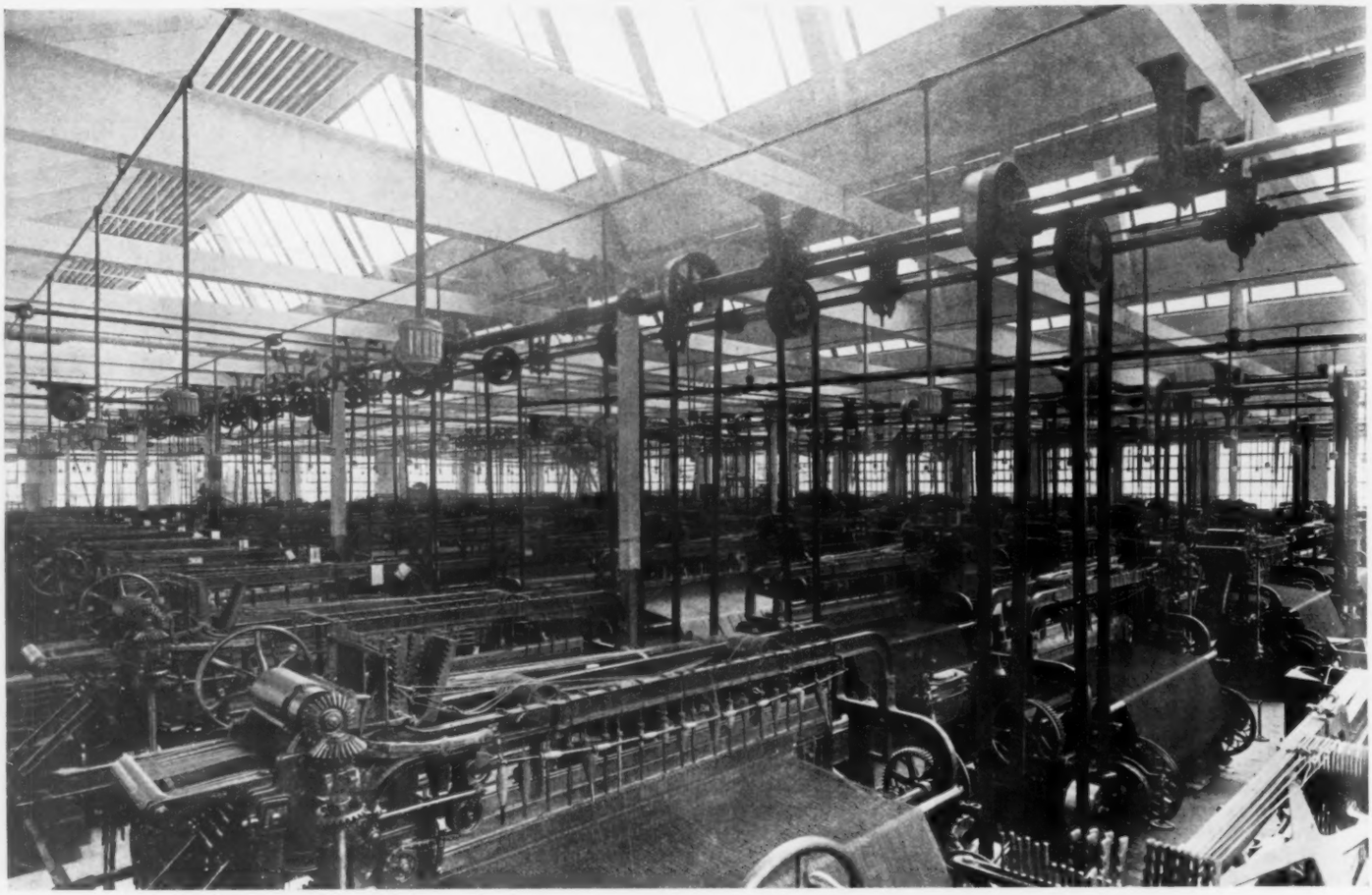
A large coal storage house is to be erected near the tracks and arrangement made for chuting the coal by gravity into the boiler house.

In addition to the unusually good lighting arrangement, every precaution has been taken for the health of the operatives. White cement finished lavatories with independent toilets and wash bowls are provided in more than ample number. Circulating ice water supplied through sanitary fountains is found throughout the plant.

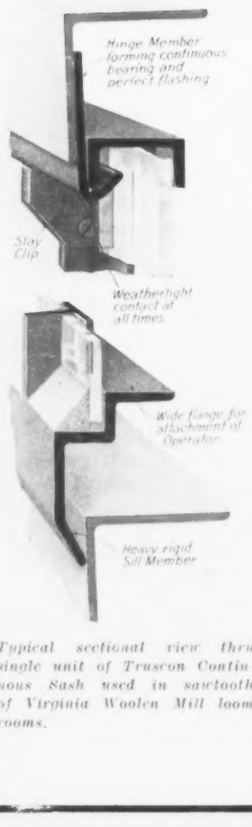
An up-to-date water filtration, purification and chlorinating plant has been constructed to provide for the bleachery and dye house. This will eventually have a capacity of 4,000,000 gallons per day; at present it supplies 500,000 gallons. The filtration equipment is from the Norwood Engineering Co., Florence, Mass.; and the softening system from the Permutit Co., New York. Parks-Cramer air conditioning system with automatic temperature and humidity control is installed throughout, while the Grinnell sprinkler system is used.

Village Extensions

The first requirement in providing



Natural Lighting is One of the Biggest Factors in Mill Planning


Hinge Member forming continuous bearing and perfect flashing
Stay Clip
Weathertight contact at all times
Wide flange for attachment of Operator
Heavy rigid Sill Member

Typical sectional view thru single unit of Truscon Continuous Sash used in sawtooth of Virginia Woolen Mill loom rooms.

Natural daylighting is the principal factor in the design of a textile mill. Artificial lighting is a matter readily handled by a competent illuminating engineer.

In the loom rooms of the Virginia Woolen Mills Co. plant, shown above, Truscon Standard Windows fill the sidewalls. Long runs of fixed Truscon Continuous Sash in the sawtooth monitor flood every loom with abundant light.

This is only one of hundreds of window arrangements that can be secured. Truscon Windows may be mechanically operated if desired.

Every mill has its particular problem and Truscon daylight engineers are always ready to help you solve them. Years of practical experience in industrial designing makes their service invaluable to you.

TRUSCON STEEL COMPANY
YOUNGSTOWN OHIO

Warehouses and Offices from Pacific to Atlantic. For Addresses see 'phone books of principal cities. Canada: Walkerville, Ont. Export Div.: New York.

TRUSCON STEEL WINDOWS

for a southern mill extension, according to Mr. Cramer, is to arrange for the living accommodations of the workers who must be added to the payroll. The work done thus far on the Mayflower Mills has necessitated the building of 248 new houses, with stores and other community features. The first lot of 24 new houses toward the 1924 extension have been started since Jan. 1.

At the present time the housing investment in Cramerton approximates $1,500,000, of which there is $250,000 invested in streets, water works, electric lights and sewerage system alone.

Some idea of the scope of this work may be gathered from the fact that it takes a force of 29 men to do nothing but look after the repairs and maintenance of the village.

The Future.

It must not be imagined that the Cramerton Mills, Inc., are going out of the yarn business. It is not their idea to increase their weaving facilities to take care of the entire yarn output. On the contrary, the latter will be increased simultaneously.

This branching out of this well-known fine yarn mill into the weaving of fine goods is an interesting example of the trend in the South. Mr. Cramer stated that it has long been the policy of the company to make this move as soon as the company was in a financial position to warrant the development of an organization large enough to constitute a self-contained and complete industrial establishment.

It will be interesting as the years go by to follow the completion of this ambitious program of the Cramerton Mills, Inc.

J. E. Sirrine & Co., Greenville, S. C., are the engineers for this development. Michael & Bivens, Inc., Gastonia, N. C., are the electrical contractors.

Southern Worsted Corporation

Spinning, Weaving and Finishing Plant for Men's Wear Under Construction at Greenville, S. C.

EARLY in the year 1923, the Southern Worsted Corp. was organized as a subsidiary of the Waterloo Textile Corp. of New York, for the purpose of constructing a southern plant and manufacturing staple worsted goods for men's wear. The directors and officers of this corporation are as follows: B. E. Geer, Greenville, S. C., president; F. A. Fleisch, New York, vice-president; A. M. Patterson, New York, treasurer; Adolph Bauer, New York, assistant treasurer; James F. Syme, Pawtucket, R. I., vice-president and general manager; Albert L. Scott, Boston, director; Alester G. Furman, Greenville, S. C., director; and A. M. Law, Spartanburg, S. C., director.

A plant site was secured about five miles east of Greenville, S. C., near the main line of the Southern Railway and on the line of the Piedmont & Northern Electric Railroad. The site secured is a portion of the Camp Sevier property, which was in operation at this point during the war. Construction of the new plant was commenced in June, 1923, and at this writing, Jan. 11, 1924, the installation of machinery is proceeding rapidly and it appears evident that the plant will be able to start full operation within the next few months. This is one of the first worsted mills to commence operation in a southern location.

The plant includes complete spinning, weaving, dyeing and finishing departments. Tops will be purchased. It will be equipped with 120 automatic looms and will require about 170 employes. A one-story type building was selected for the layout, and machinery is so arranged that worsted tops will be received at one end and finished cloth taken out of the other with the shortest straight line of travel for all material throughout.

New Plant of Southern Worsted Corp., at Greenville, S. C.

The main manufacturing building is constructed with brick walls, timber framing, with large windows of steel sash, and two wide monitors running the full length of the building. The main building is 180 ft. in width and 580 ft. in length and is provided with outside towers for toilet and locker rooms.

A small boiler plant for heating only is being constructed; the Southern Power Co. will furnish power. Looms will be equipped with individual motors and other machinery will be taken care of by group drives.

An attractive village is being built adjoining the mill and includes 80 operatives' houses, 4 overseers' houses, and a company store. Space is provided for the later addition of a schoolhouse and other community features. The entire project was planned and is being carried out under the direction of Lockwood, Greene & Co., engineers, of Charlotte and Boston.

Naumkeag Addition

Increase Weaving Capacity and Enlarge Cloth Room Department

Construction contract has been awarded for a large addition to the plant of the Naumkeag Steam Cotton Company at Salem, Mass., manufacturers of the well known Pequot sheets and pillow cases, and construction work will be started immediately. From the consistent record of this company in doing the right thing at the right time, it would appear that conditions are ripe for the resumption of cotton mill building on a larger scale in New England.

Plans for the enlargements have been made by the mill's own engineering force under the direction of J. Foster Smith, agent of the Naumkeag Steam Cotton Company, and call for a cloth room 108 by 316 feet, one-story high, with sawtooth roof, and an extension to the weave shed, 145 by 475 feet, with sawtooth roof, to house 1,000 additional looms. It is understood that these looms will take care of the work now done on the night shift in the weaving department.

The construction contract has been awarded to William T. Reed Co., Boston, Mass., and is the eighth contract received by them for construction work from the Naumkeag Company. Buildings will be of reinforced concrete and will conform in style and appearance to the present buildings. The development will cost in the neighborhood of half a million dollars, it is stated.

New Dye House

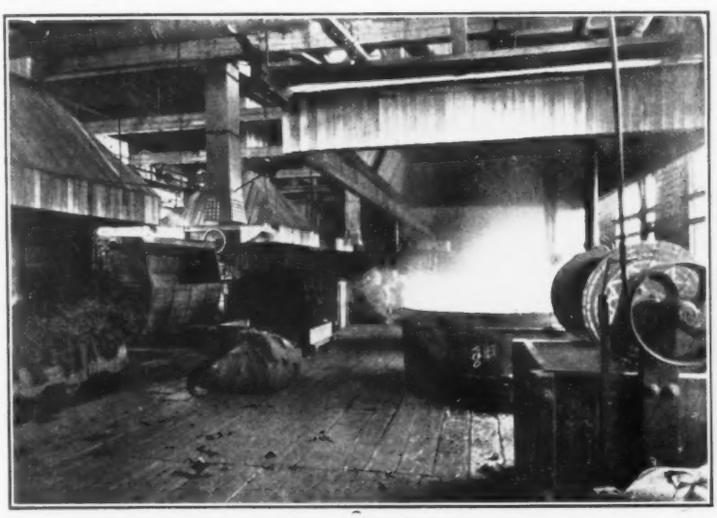
For Raw Stock Dyeing at Camden Woolen Company

A new dye house for the Camden Woolen Company, Camden, Maine, has recently been put into successful operation. The product of this plant is cloakings and dress goods and all processes for the conversion of raw stock into finished goods are carried on. The new building is a one story structure, 69 by 52-ft., of brick, wood sash, with wood roof of monitor construction. An office for the dyer and a drug room are conveniently located in one corner. Ample working spaces are provided between the dye tubs and other machinery in the layout. The work was carried on without interruption to manufacturing by building underneath the old roof and eventually tearing away such parts of the old structure as were not used. Provision was made for taking care of the steam from the processes and keeping the rooms clear under working conditions. Charles T. Main, engineer, Boston, was in charge of this work.

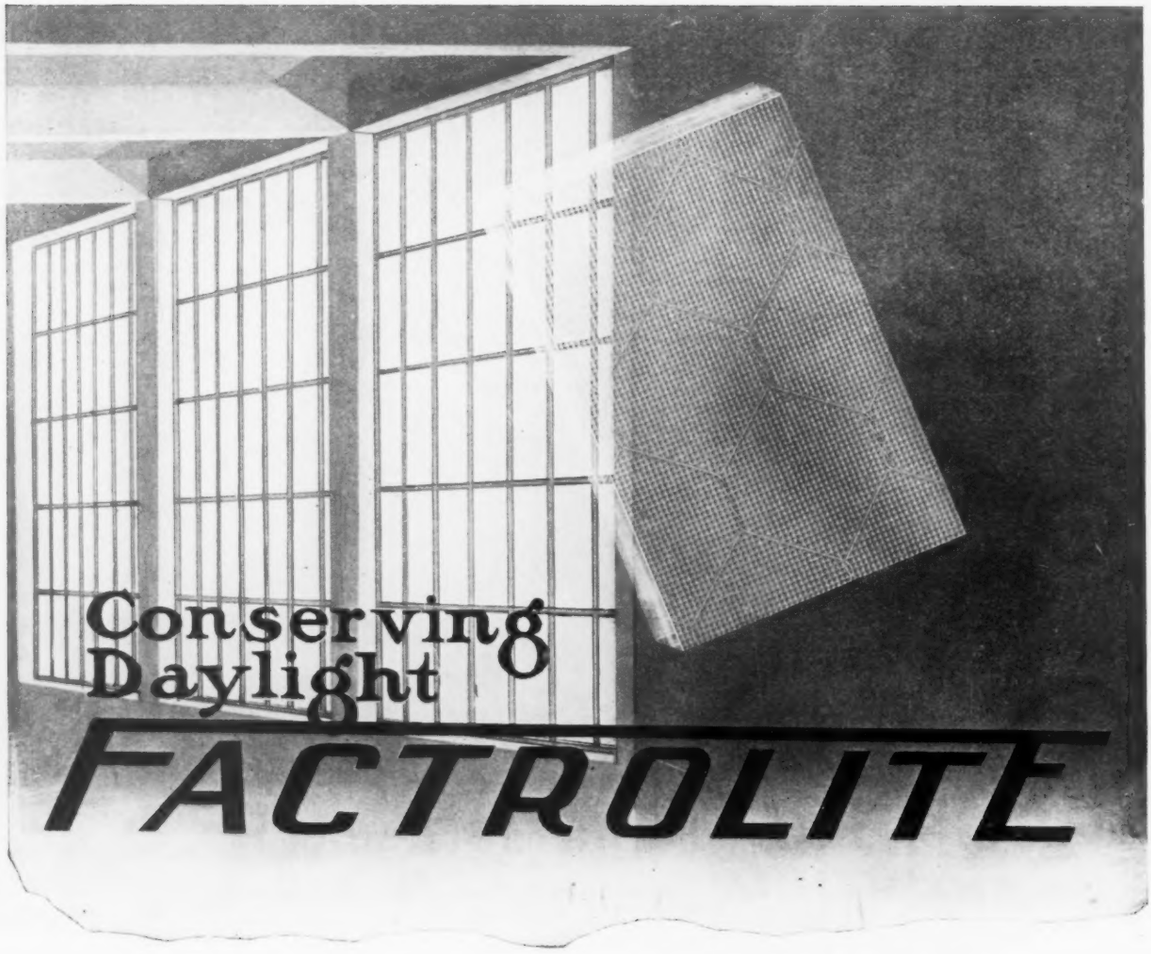
Schuster Woolen Co.

Dye House Revamped and Working Conditions Improved in Massachusetts Mill

THE original dye house of the Schuster Woolen Co., East Douglas, Mass., was built about twenty years ago and at that time was representative of good dye house construction. The building and equipment served its purpose well. But the demands of modern manufacturing conditions made it increasingly difficult to operate successfully and recently the management decided to improve working conditions by making minor alterations and installing new auxiliary equipment. The changes, which were carried out under the direction of Charles T. Main, Boston, who was also the engineer for the original dye house, were made without interfering with production or changing the location of the dyeing machinery. It is now possible to operate this department and maintain a clear atmosphere. The dye house problem of this company is typical of that existing in many of the smaller woolen mill dye houses throughout the industry.



Dye House of Schuster Woolen Co., With Processes in Full Operation



On the sunny side of a big "daylighted" factory, on a bright day, is ordinarily a blinding place to work. Whether the men place temporary sun shades to relieve the eyestrain, or put on dark glasses, shop production slackens — the work drags — there is economic waste.

Mississippi Wire Glass Company

220 Fifth Avenue
New York

Chicago, Ill.
St. Louis, Mo.

The scientific way to correct this trouble is to forestall it by specifying "FACTROLITE" for glass in sidewalks, monitors and skylights.

FACTROLITE diffuses the sun's rays so that you can look Old Sol right in the eye behind a "FACTROLITED" sash.

Then, too, FACTROLITE checks *reflection* from the outer side of the panes. It gathers in rays from a wider angle of incidence than ordinary glass and refracts them into a diffused, shadowless daylight indoors.

"FACTROLITE" is the result of years of research work. It is offered to the engineering public as the latest development for *daylighting* factories and offices. Made in both plain and wire glass. A free sample sent to engineers. *Mark and mail the coupon.*

Mississippi Wire Glass Company,
220 Fifth Avenue, New York.
Gentlemen:
Send me a Catalog and Factrolite Paper Weight as advertised in Textile World. It is understood this does not obligate me in any way.
Name .....
Address .....

Reconstruction at Jamestown Worsted Mills

New Buildings for Dyeing, Combing, Preparing and Drawing Processes—Manufacturing Departments Arranged to Reduce Trucking—Machinery Improvements—Power House Rebuilt and Economies Made in the Use of Steam for Heating and Processes—New Filter Plant

By *W. O. Crossman**

THE Jamestown Worsted Mills of Jamestown, N. Y., have entered upon the last stage of their extensive reconstruction program, begun in the spring of 1922, and are now moving machinery into the new quarters. The owners of this plant have made a successful effort to build a modern worsted mill within the shell of an old one, keeping up production all the time. They have used all that was serviceable of the former equipment, but by rearranging it, remodelling some of it, and introducing new processes where needed, they have brought within reach all the essential advantages of a new plant.

The old buildings that are suitable for manufacturing processes are being repainted throughout, new floors have been laid, and a modern lighting system installed. All of the buildings have been equipped with fireproof stairways, new elevators and toilet rooms.

Two Acres of Space Added

The construction program has included a new dye house, a new building for the combing, preparing and drawing processes, a new filter plant and a rebuilding of the power house. One of the older buildings was extended both upwards and outwards, and a number of small additions and alterations were made in other portions of the plant. Of the alterations carried out perhaps the most noteworthy is the method of increasing daylight in a number of the rooms by extending the old wood sash windows up to the ceiling.

All of the new buildings are of brick, the framing being concrete, steel or timber as determined by local conditions. A number of unusual features have been introduced in the dye house, particularly in the combination of part of the ventilating system with a double roof construction for preventing condensation on the ceiling of the one-story sawtooth portion. The new building for combing and drawing has a heavy concrete slab on concrete framing at the second story level to withstand the vibration of the combs; the upper portion of the building being built with wood floors on a steel frame. More than two acres of new floor space have been added to the plant, for which about half an acre was torn down.

Handling Stock in Process

In the rearrangement of machinery the entire dyeing, combing and preparing, drawing, spinning, twisting and finishing departments are being moved to new locations, as well as the greater portion of the warp dressing department. A new process of filling winding has been introduced. The wool sorting, carding, weaving and inspection departments are satisfactorily located at present and were unchanged.

In planning the rearrangement emphasis was placed on securing a location for each department that would involve the least possible trucking of the products to and from that department, and that would at the same time arrange each department in a building suited to its needs. With a plant roughly in the form of a hollow rectangle of buildings, less than two hundred feet wide but nearly a quarter of a mile long, the proper location of departments has an important bearing on the cost of handling the stock in process.

Wool coming into the plant is now stored, sorted, washed and carded in a single building. It passes through two processes of gilling in the card room itself, and then goes directly to the combing room on the same floor in the adjoining new building. There is a storeroom for tops and noils in the basement below the combs; the dye house adjoins the top storage room and the third and fourth floors over the combs contain the drawing and roving processes for filling and warp yarns, respectively.

From the drawing rooms the stock works continuously through the spinning, winding, twisting and warp dressing departments, all of which are on the third and fourth floors, to the weave sheds at the other end of the plant. The second floor is used for the return trip; the burling, mending and inspection departments being located on this floor on the way back to the finishing departments in the dye house and adjoining buildings. The first floors are used for shipping and receiving rooms, offices, shops and storerooms.

Rewind Filling

One important change in the established processes of the mill is being made during the reconstruction. All of the older filling spinning frames are being discarded. These are cap frames, spinning on a very small bobbin. All the warp frames and the newer filling frames are being rebuilt as moved; lengthening them from 144 to 192 spindles with parts of other frames, thoroughly overhauling them and installing new caps, spindles and tubes. These changes will make the warp and filling spinning frames exactly alike, all capable of increased speed, and all spinning on a package half again as large as the present warp bobbin, and more than two and one-half times as large as the present filling bobbin. Production is increased so much by these changes that less than 2,000 spindles on new frames have been purchased to bring the total capacity up to the former level, although old frames totalling nearly 5,000 spindles are being discarded. All the changes are being made by the mill mechanics, and all without materially interfering with production.

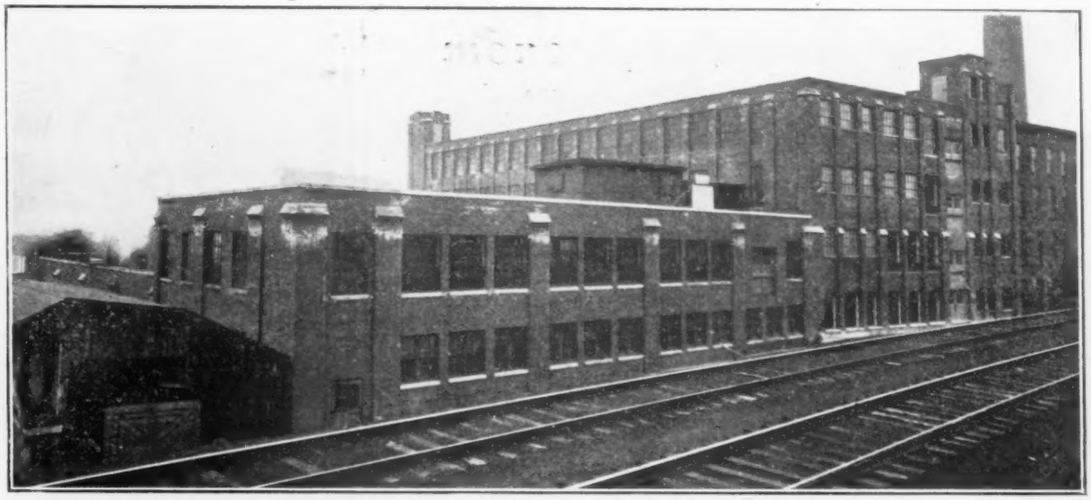
Under the new arrangement warp bobbins are handled as before, the change merely providing an increased production and a smaller number of knots. The filling yarn, however, is transferred to a special quill on Universal winders and is used in new shuttles in the present looms. These new filling packages run nearly three times as long in the loom as the present ones, increasing production and decreasing the work of the knot pickers very materially. Slub catchers on the winders provide an inspection for the filling yarn that was not available before.

Power Plant Reconstructed

The work in the power plant presents some features of interest because of the point of view from which it was approached. At first thought there seemed to be no question but that a new power plant would be required. The load had outgrown the capacity of the plant; the buildings were in bad shape; and there was no room for extension on the present site. Some of the equipment was worn out and the rest was so old that, while in serviceable condition, it hardly seemed advisable to move it into a new building. In the water was heated by steam in the latter class were the boilers, engines, steam turbine and electrical equipment.

Further study, however, developed the fact that much of the steam generated was getting away without doing its share of the work, that one of the electric generators was limited in its output by lack of ventilation, that warm water was being thrown away in the engine room while cold water was heated by steam in the manufacturing processes.

The changes in the power plant were therefore aimed at a reduction in the load on the present equipment, rather than additional equipment to meet the load. The needed reconstruction of the building was carried out over the heads of the firemen and engineer. The old heating system was replaced with a new vacuum sys-



Rear View of Dye House and New Building No. 16 of Jamestown Worsted Mills; Sulphur Bleach House on Roof of Dye House. Fog Over One-Story Portion of Dye House Due to Vapor from Boiling Dye Tubs, Discharged Outdoors by Exhaust Fans at this Point; Sheds in Lower Left Now Being Removed.

* Lockwood, Greene & Co., Engineers, Cleveland, O.

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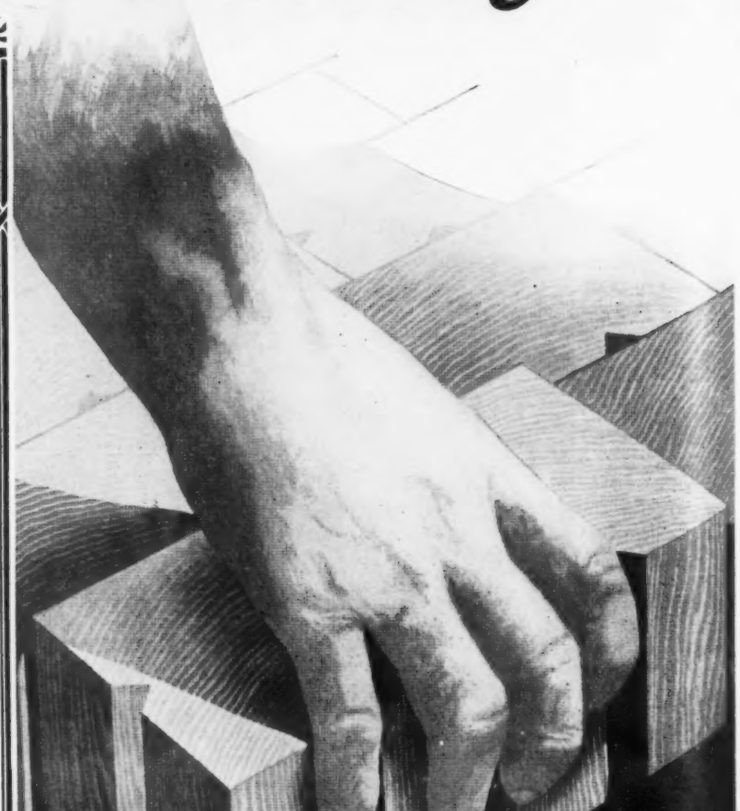


FLOORS

WOOD BLOCK

tem running largely on exhaust steam. Soot blowers were installed in the boilers and a new smoke stack built. Old pumps, heaters and auxiliaries were replaced or supplemented by new and more efficient equipment.

The new filter plant for the dye house water supply was made of sufficient capacity to furnish condensing water. Filtered water was then used for condensing, heated still further with exhaust steam before leaving the boiler room and pumped to the dye house and wool scouring room. It reaches the tanks in these departments warm enough to reduce by at least one-third the heavy demand for steam which they normally make, particularly in the winter time. With the exception of the cold water and live steam, necessarily used for dyeing and wool washing, every gallon of water and every pound of steam is now normally used at least twice before being thrown away.

The Jamestown Worsted Mills manufacture women's dress and skirt fabrics and men's suitings. They were one of the first worsted mills in this country to manufacture a finished worsted fabric from the raw wool. The first building was erected in 1873, just fifty years ago, and is still in use. The production of men's wear is sold through Arthur G. Meyer & Co., of New York City. The dress goods are sold by their direct representatives.

The reconstruction program was outlined in a report made by Lockwood, Greene & Co., engineers, in May, 1922. The plans have been developed and the work carried out under the immediate supervision of Lockwood, Greene & Co.'s Cleveland offices.

Peerless Woolen Mills Enlarge

New Dye House and Spinning Room at Rossville, Ga., Plant Include Many Interesting Features

A PLANT increase representing an investment of $225,000 for new construction and equipment has been made by the Peerless Woolen Mills, Rossville, Ga. A new dye house and a new mule room have been built, giving a large addition to manufacturing capacity. The following description of the development has been written for TEXTILE WORLD by W. H. Sears, architect-engineer, Chattanooga, Tenn., who prepared the plans and supervised the work for the owners:

This addition adjoins the main mill on the North and was built to take care of the growing business of the Peerless Woolen Mills. It is built so as to form, with the old building, a hollow square. The exterior dimensions of the building are 258 ft. by 144 ft., with an inside court 66 ft. by 134 ft. The foundation is of rubble masonry partly from stone quarried on the lot. The walls are of shale brick, reinforced at all structural points with brick pilasters.

Due to the conformation of the site the floor level of this addition is considerably above the ground, permitting a basement storage room under the mule room half of the building. This storage room with 14,000 sq. ft. of floor space is finished with a concrete floor and is used for the storage of wool and dye materials. Delivery of materials is made directly from the grade level into this basement.

Dye House Features

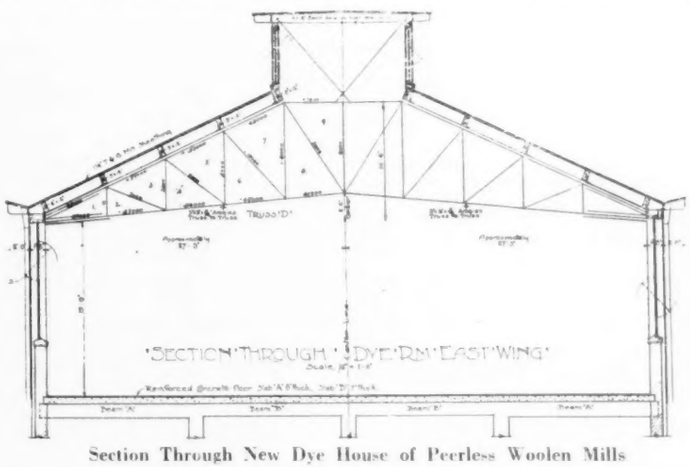
The dye house adjoins the old dye house and covers an area of 13,000 sq. ft. This room has a reinforced concrete floor carried on piers and concrete beams and is designed for the equipment to be placed in pits in the floor. This floor, being several feet above the ground, permits ample height for inspection and drainage of all machines below the floor. This space allows ready access for cleaning trenches of waste and also permits adjustment and repairs of machines from below.

Drainage is arranged for by means of open concrete trenches carried below each machine. All lateral trenches are run into one large trench and in turn to a settlement tank outside the building, where wool and waste may be readily recovered.

The dye house embodies many original features that are in successful use in other dye plants designed by the writer. One wing of the dye room is 54 ft. by 144 ft., and the other wing is 75 ft. by 68 ft., with only four columns in the entire dye house. The exterior walls are 16 ft. high to the roof line. The roof is carried on steel trusses about 16 ft. on centers. On these trusses rest wood purlins at the panel points of the trusses. Two-inch mill sheathing is nailed direct to these purlins. The roof material is of built up composition.

Ventilation is secured by means of one large monitor extending the full length of each wing. This monitor is 14 ft. wide and about 6 ft. high and the sides are completely filled with steel sash. These sash are operated by means of continuous sash operators. It is this monitor construction, together with the proper slope of the roof and the arrangement of the lower windows which secures freedom from fumes, fog and condensation. It is found that the building is perfectly ventilated in all conditions of temperature and humidity and there is freedom from moisture and condensation. No fan or forced ventilation of any character is employed.

Interior View of Spinning Room; Cards Temporarily Stored Here



Section Through New Dye House of Peerless Woolen Mills

Partial equipment of this dye room consists of one Sargent wool washer; two Philadelphia Drying Machinery Co.'s drying machines and provision for a third; two Klauder-Weldon dyeing machines and provision for a third. There are also installed one Sargent duster; one Vacuum Dyeing Machine Co. vacuum dyer; one warp drying machine; one warp dryer and three hydro-extractors. All machines are driven by individual motors.

Mule Room

The mule room is somewhat larger than the dye house due to wider spans. This floor of semi-mill construction is carried on wood columns in the basement. On top of the mill construction floor is a 7/8 in. maple floor. The mule room has only four columns, the roof construction being similar to the dye house, except that there is no monitor, but abundant light is secured by means of steel sash in exterior walls. Roof ventilation is secured here by means of several large rotary ventilators. Equipment of this mule room consists of fifteen mules.

Material is handled between the basement storage room and the dye house by means of a reinforced concrete ramp in the inner court and no elevator is used. The entire building is protected by a two source sprinkler system and will have ample heating, plumbing and lighting equipment.

This addition ties in with the older mill to form a well rounded plant of high operating efficiency.

New Dye House of Peerless Woolen Mills; New Spinning Mill in Background

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New Plant of Art Cloth Mills at Lowell, N. C.

Total Capacity of 1000 Looms for Producing Fancy Dress Goods, Shirtings and Draperies—Original Installation to Be 600 Looms—Village Laid Out for 170 Houses, of which 112 are Built Now — Natural Beauty of Location is Being Utilized to Effect Usually Attractive Community

FROM at least two standpoints the new development of the Art Cloth Mills at Lowell, N. C., is of decided interest. One is that the plant now under construction is an addition to the rapidly growing ranks of those in the South producing fine mixed goods; while the other is that the natural beauty of the site chosen promises to make the mill community, when completed, one of the outstanding villages of the South.

Established in August, 1922, this company has been operating at Gastonia, N. C., with an equipment of 96 looms. This plant is being abandoned and production will be concentrated at the new mill in Lowell. The product will be fancy cotton and silk dress goods, shirtings, drapery fabrics, etc.

Site of 477 Acres

The new site covers 477 acres, with more than a half-mile water front on the south fork of the Catawba River. The building is single story, 595 by 192 ft., reinforced concrete, of daylight construction, the concrete reaching to the window sills, and the remainder of the walls being built up with steel columns and steel sash. This gives practically continuous light openings all the way around the building. The sash is Fenestra, made by the Detroit Steel Products Co. The roof is monitor construction, there being eight monitors set crosswise with the building, each monitor 3 ft. high, 10 ft. 8 in. wide and 27 ft. long. The roof covering consists of 5-ply tar and gravel, with an insulation of Celotex, supplied by the Celotex Co., Chicago, to prevent condensation. The floor is tar concrete, with a sub-floor of 2½x6 pine and a top floor of maple.

One of the most noteworthy features of the construction of this mill is the kind of timber employed for beams. These are 12 by 16 inches, ranging from 27 to 30 feet in length. Excellent timbers of this size are rare nowadays and are not easy to secure. There are approximately 375 in the building. These were specially selected, a man being sent direct to the woods to inspect them.

Layout of Mill

The plant has been planned to accommodate 1,000 looms with proportionate auxiliary machinery for dyeing, winding, warping, slashing, etc. The original installation will be 600 looms, but care has been taken to leave sufficient gaps in each department of the plant so that additional machinery of each kind may be added easily, and the continuity of the processes may be entirely maintained when the 1,000-loom capacity is reached.

Section of Village Development of Art Cloth Mills.

One end of the building, 177 feet long, has been set aside for the preparatory operations. The dye house will contain at the start four Franklin Process Co. machines, one being 500-lb., one 200-lb., one 50-lb. and one 6-lb. sample machine. There will be an initial installation of five Entwistle warpers; 16 Universal No. 16 package winders of 10 spindles each; 28 Universal No. 90 filling winders of 20 spindles each; five beamers, and four slashers supplied by the Cohoes (N. Y.) Iron Foundry & Machine Co. In the center of the preparatory room is provision for yarn storage.

The weave shed occupies the remainder of the building. All the looms will be individually driven with General Electric Co., ½ and ¾ horsepower electric motors. Westinghouse motors are to be used on the equipment in the other departments. The lighting in the plant is direct, employing R. L. M. reflectors and 300-watt bowl-enamelled lamps.

The looms are all Crompton & Knowles automatic, including 98 46½-in. reed space, 6 x 1, 30-harness dobby dress goods looms; 204 48½-in. reed space, 4 x 1 box, 25-harness dobby dress goods looms; 100 48½-in. reed space, 4 x 1 box, dobby dress goods looms; 100 48½-in. reed space, 1 x 1 box, dobby dress goods looms; 50 48½-in. reed space, 4 x 1 box, jacquard dress goods looms; and 50 52½in. reed space, 4x1 box, jacquard dress goods looms. The jacquards are double lift, single cylinder. There will be a basement 200 feet long under one end, which will contain the gray yarn storage room; burling, mending and cloth packing departments; and the machine shop.

A deep well, with a capacity of 60 gallons per minute, will provide water for processing and for drinking purposes. Outside of the main mill building are a boiler house, with two Casey-Hedges boilers for supplying heating and process steam; a fire pump house, with a 1,000-gallon motor-driven Worthington fire pump; and a cement reservoir. Power is purchased from the Southern Power Co., a power line crossing the property.

The Village

The village development surrounding the Art Cloth Mills is laid out for 170 houses of which 112 have been built. The community reflects personality and individuality which mark it as quite distinct from the routine mill-village type. The streets have been arranged in semi-circles, to get away from the monotonous appearance of rows of houses; as a result, a park-like effect is being realized. Shade trees are being planted throughout the village. The houses themselves are varied in type and in painting, giving the appearance of any good suburban community. In each are bath-room, sewerage connection, water and electricity. Each room contains a clothes closet. The walls are finished with woodwork half-way up, the remainder being tinted plaster. In several cases a second story containing two additional rooms has been constructed.

A block of stores is being built and will contain a general store, grocery store, barber shop, pressing club and post-office. Upstairs will be an auditorium with a seating capacity of 650.

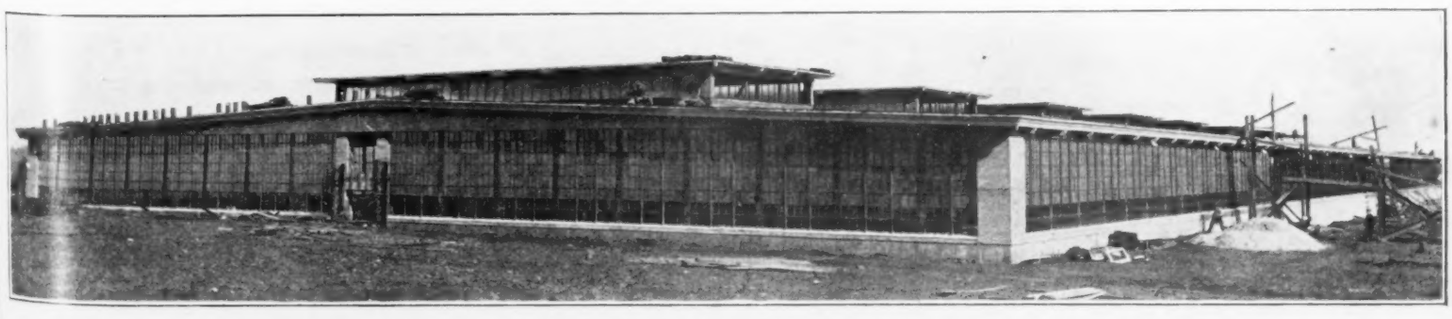
Most of the site is wooded and there are three natural parks which add to its attractiveness as a place to live. The extensive water-front offers opportunities for boating, fishing and swimming. A seven-grade school has been arranged for and will be ready for the opening session in the fall.

J. E. Sirrine & Co., Greenville, S. C., are the engineers in charge of the work, and the Brown-Harry Construction Co., Gastonia, N. C., are the contractors. Bahnson humidifiers are employed throughout. Fire protection equipment is being installed by M. J. Dougherty & Co., Philadelphia. The plant will start in limited operation in March or April.

Columbian Mfg. Co.

Addition to Building Increases Manufacturing Space

The Columbian Manufacturing Co., Greenville, N. H., manufacturers of blue and brown denims, recently carried out changes in the arrangement of their machinery which made it necessary to secure additional floor space close to certain operations. There was no spare land available, and after much study it was decided to add one story to an existing building. This building was

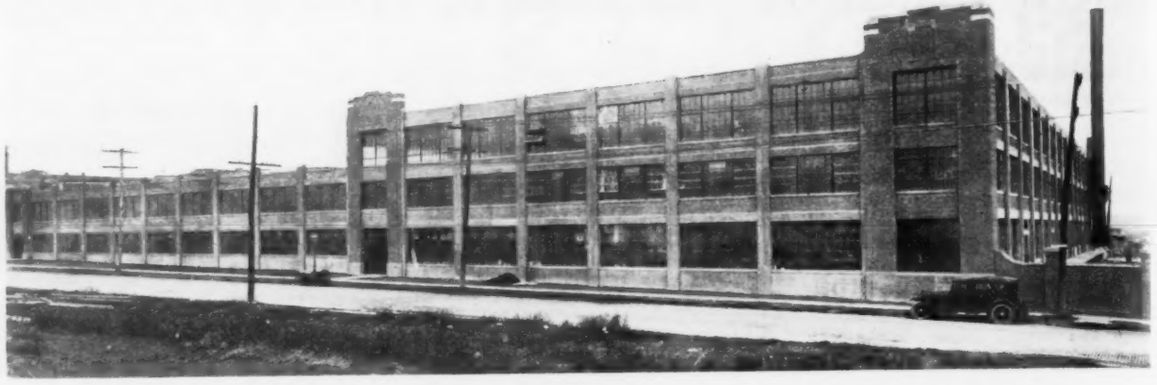


New 1,000-Loom Plant of Art Cloth Mills at Lowell, N. C., for Colored and Fancy Fine Cotton and Silk Mixed Goods.

Plant of the Columbia Can Co. St. Louis

Approximate Data:
Area 180,000 sq. ft.
Cost $270,000.
Construction time — 100 working days.

AN EXAMPLE OF WIDMER ECONOMY & SPEED



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of slow burning mill construction with a flat roof and the new story in general followed the design of the old construction.

The first floor is used for chain dyeing; the second, for chain warp drying and splitting; and the new third story is to be used for automatic looms. Particular attention was given to the bracing of this new story to reduce the vibration resulting from high speed looms. The work was done without suspending operations or interfering seriously with production on the floors below. It was necessary to replace the columns in the first story and strengthen other parts of the building to receive the additional story.

The looms are belt driven and divided into four groups with a motor driving each group. The room is lighted by large units spaced to provide general illumination. There is the usual equipment for heating and sprinkling. Charles T. Main, engineer, Boston, designed this enlargement.

Redevelopment of Water Power

Two Old Water Powers at Salmon Falls, N. H., Replaced by One Modern Hydro-Electric Plant

WITH the larger use of electric power in textile mills we find many manufacturing companies redeveloping more or less obsolete water powers into single modern hydro-electric plants, and in some cases tying in with existing power circuits so as to be able to interchange power in emergency or to dispose of excess power to public utilities or to other manufacturing plants.

The older installations of water wheels are not very efficient if measured by the standards of the present day. As power requirements grow, existing water wheels are often discarded for new and more efficient modern turbines. The gain in extra power sometimes is sufficient to pay for the redevelopment in a short term of years.

An example of the old type of development where canals from separate dams conducted the water to several sets of wheels was at the Salmon Falls Manufacturing Company, Salmon Falls, N. H., one of the most successful producers of tire fabrics in the country. Here two timber dams held the water of the Salmon Falls River to provide a total head of 48 feet.

History of Development

Having in mind the future combining of the two water powers into one, in 1912 when the upper timber dam needed repairing, it was replaced by a concrete dam built against the face of the existing dam. The old dam was used as a coffer dam to protect the new work during construction. The power obtained from the river at this time was 700 horsepower from the upper wheels and 450 horsepower from the lower, a total of 1150 horsepower.

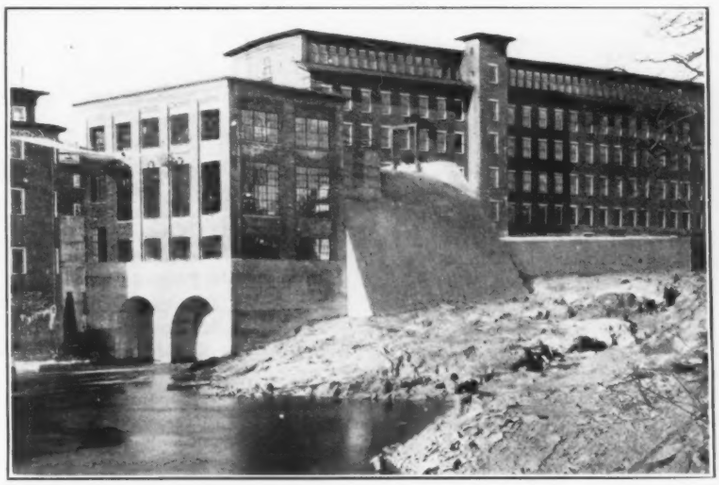
In 1914 a part of the old canal wall of the upper dam washed out. This section was replaced by a sluice gate and spillway section, later to become a part of the combined development.

The company, in 1922, found that there was a large deficiency of power from the old wheels, and it was then decided to complete the redevelopment by building the new power house and other work connected with it. The new power plant is located near the westerly abutment of the lower timber dam. Just upstream is an open concrete forebay to which water is conducted by means of a reinforced concrete conduit 520 ft. long. The intake for this was built in the old canal just below the waste sluice referred to in the preceding paragraph.

It was necessary to build the new plant in two stages, in order to interfere with the operation of the mills as little as possible, and the work was planned and carried out in such a way that the company was without power from the river for only two weeks during the entire construction. During the first stage of construction, the part of the lower dam partly covering the site of the power house and forebay was removed and the power house, forebay and a short section of conduit were built. This also included the installation of the new turbines and generators. While the work was in progress the upper water power plant of 700 horsepower capacity was kept in operation, the discharge from it being diverted around the new construction work.

As soon as the new plant was in operating condition, the upper power plant was discontinued and as much of the river as could pass through the new turbine units was directed into the new forebay through a temporary opening in the wall. The new turbines were thus operated under a reduced head of 25 ft., similar to the head on the original lower plant, and the old upper wheels were shut down while the balance of the construction work was carried on. This arrangement was made to provide the greatest amount of power until the remainder of the conduit with the intake was built.

When the remainder of the conduit and the intake were completed, it was necessary to stop the entire water power until the temporary opening in the forebay was filled with concrete. This took two weeks, which was the only time during the entire construction period that the mills were without some power from the river.



New Hydro-Electric Plant at Salmon Falls, N. H.

Interior of Salmon Falls Manufacturing Co. Power House

Power Equipment

The new equipment includes two modern single runner vertical plate steel spiral case hydraulic turbines, each of 1,500 horsepower capacity, which are direct connected to two 1,000 K. W., 600 volt, 60 cycle, 3 phase alternating current vertical type electric generators. Each generator is provided with a direct-connected exciter. In addition, the station contains a motor generator exciter set, two oil pressure governors and two 1,000 gallon per minute motor driven centrifugal fire pumps.

A central switchboard was installed which controls the new hydro-electric plant, the company's auxiliary steam plant and outdoor sub-station. This sub-station of 2,000 K. V. A. capacity connects the power system of the mill with that of a public service company serving the surrounding territory. This provides for interchange of power. Charles T. Main, engineer, Boston, designed and supervised the construction of this development.

Newichawanick Co.

Dam Built for Redevelopment of Two Small Powers

IT is planned to redevelop the water powers of the Newichawanick Company at Great Works, Maine, and the first step in this work has been completed. The original water power consisted of a rock dam developing a head of 17-ft. and about 200-ft. below this a timber dam developing about 27 foot head. As part of the redevelopment a concrete dam

W. H. SEARS, *Architect*

Member American Institute Architects, American Society Heating and Ventilating Engineers, American Society Civil Engineers

1102-1103-1104 James Building

CHATTANOOGA, TENN.

Partial list of textile mills designed by this firm

Davenport Hosiery Mills	Chattanooga, Tenn.
United Hosiery Mills	Chattanooga, Tenn.
United Hosiery Mills	Bridgeport, Ala.
United Hosiery Mills	Bristol, Tenn.
Loudon Hosiery Mills	Loudon, Tenn.
Loudon Hosiery Mills	Greenville, Tenn.
Loudon Hosiery Mills	Sevierville, Tenn.
Loudon Hosiery Mills	Newport, Tenn.
Sweetwater Woolen Mills	Sweetwater, Tenn.
Signal Knitting Mills	Chattanooga, Tenn.
Sunshine Hosiery Mills	Murfreesboro, Tenn.
Aycock Hosiery Mills	S. Pittsburg, Tenn.
Aycock Hosiery Mills	Whitwell, Tenn.
Kingsport Hosiery Mills	Kingsport, Tenn.
Albany Hosiery Mills	Albany, Ala.
(For Cooper, Wells Co	St. Joseph, Mich.)
Kincaid Hosiery Mills	Griffin, Ga.
W. B. Davis & Son	Ft. Payne, Ala.
Richmond Hosiery Mills	Daisy, Tenn.
Kyle-Shelton Co	Chattanooga, Tenn.
Franklin Hosiery Mills	Winchester, Tenn.
Peerless Woolen Mills	Rossville, Ga.
Cooper, Wells & Co	Albany, Ala.
American Textile Woolen Mills	Athens, Tenn.
Hurlbut Hosiery Mills	Tuscaloosa, Ala.

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CONSULTING ENGINEER

Woolen and Worsted Mills

Knitting Mills

Steam and Water Power Plants

Organization Design

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was built during the summer of 1923, downstream from the rock dam. This dam averages 16-ft. high and is about 170-ft. long. A 3-ft. 6-in. sluiceway with gate and hoist was built into one end and on the other end of the spillway was built the head gate, racks and hoist of the future development. The old intake of the upper water power was rebuilt on the face of the new dam. Provision was made to block this opening without lowering the water in the pond, when the future development is completed and the old intake no longer needed.

The future development will consist of a brick power house built below the present timber dam, water being conducted to the hydraulic turbine from the intake already built in the concrete dam by a steel penstock about 250-ft. long. The new hydro-electric plant will have a net head of 46-ft. and will develop 600 horsepower.

This work is of interest as the new concrete dam is on the site of one of the first water powers, if not the first, developed in Maine. During the construction of the new dam a part of the old timber sluiceway of the first water power was uncovered and removed. The stone foundation piers of the original development, which was a saw mill, can still be seen standing below the new concrete dam. Charles T. Main, engineer, Boston, is in charge, making plans and specifications and his organization supervising the work.

Knitting, Weaving and Yarn Mills Increase

Pitman Manufacturing Co. Builds New Dye House and Manufacturing Building—Cub Knitting Mills Enlarge Plant—Roubaix Mills Build Finishing Plant and Extend Dye House—Star Worsted Co. Erect Worsted Yarn Mill—Multiple Winding Company has New Building

By *Howard E. Cousins**

THERE was considerable work done during the last year in enlarging and improving existing mills. Among plants in Massachusetts and New Hampshire which increased their facilities by the erection of additions to give more space are the Pitman Mfg. Co., Laconia, N. H., manufacturers of hosiery; Cub Knitting Mills, Malden, Mass., makers of union suits and sweaters; Roubaix Mills, makers of worsted and woolen dress goods at Clinton, Mass.; Star Worsted Co., Fitchburg, Mass., combers and spinners of worsted yarns; and the Multiple Winding Co., Malden, Mass., manufacturers of yarn for electrical insulation.

Pitman Manufacturing Co.

The new dye house and manufacturing building erected for the Pitman Mfg. Co., at Laconia, N. H., is one of the most interesting of the smaller construction projects handled during the last year by the engineering organization with which the writer is connected. This company manufactures seamless cotton, wool and merino hosiery. The building was constructed during the winter months, and occupies the same space as their old dye house. The building was erected without interference with their production, being built around the old dye house which was not removed until the new building was pretty well covered in.

This new structure is 92 ft. by 64 ft., three stories in height. It has steel beams, wood floors and brick walls, and is equipped with the most modern lighting, sprinklers, heating and also an elevator. The basement is used for dyeing and scouring, there being at present installed one scouring machine, three dyeing machines, a 600-lb. Franklin Process Co. machine, a 15-lb. Franklin Process Co. machine, two extractors and three rinse boxes.

The first floor is used for seaming, rough mending, and winding. On this floor are installed 54 loopers, and five cone winders. The cone winders have a partition around them to prevent the flyings from getting into the stockings as they are being rough mended. The top floor is used for knitting.

*Lockwood, Greene & Co., Engineers, Boston.

Cub Knitting Mills

The Cub Knitting Mills of Malden, Mass., manufacturers of union suits and sweaters, formerly known as the Yale Knitting Co., are now occupying the extension to their plant. The new building is 55 ft. by 100 ft., two stories in height. It is designed for one additional story, and has steel beams, wood floors and wood sash.

On the first floor of the building are the treasurer's and sales offices, and the main work room which is devoted to sweater yarn winding, the manufacture of sweater parts, and also the finishing department. After these sweaters are manufactured, they are then sterilized on this floor, boxed and trucked to the cold storage department in another building. The second floor is occupied by an auxiliary cold storage room for yarn, yarn winding and underwear department. There is also provision on this floor for future bleaching and drying.

Underwear Department on Second Floor of Cub Knitting Mills Extension at Malden, Mass.

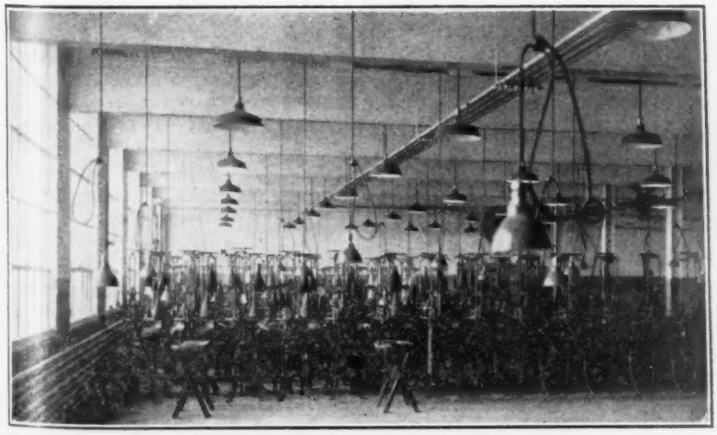
Roubaix Mills

The new addition to the finishing building and dye house for the Roubaix Mills, Inc., of Clinton, Mass., manufacturers of worsted and woolen dress goods, is now in full operation. There are three stories, approximately 62 ft. by 50 ft. Directly in the rear is a one-story extension to the dye house which is 100 ft. by 62 ft.

The finishing building is entirely fireproof, it being of steel frame encased with concrete, with concrete floors and roof, and brick walls. The dye house is built up of brick and timber. An interior view of the finishing building is shown herewith and the excellent natural light will be noted; also absence of congestion in the working areas. Machines are belt driven and the system of artificial lighting installed provides general illumination of the room.

Star Worsted Co.

The Star Worsted Co., of Fitchburg, Mass., manufacturers of worsted yarns, will soon occupy their new building, which is 126 ft. by 67 ft. by



Corner of Knitting Room in Pitman Mfg. Company's New Mill at Laconia, N. H.

View in Finishing Building at Roubaix Mills, Clinton, Mass.

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Deliver clean steam at all ratings.

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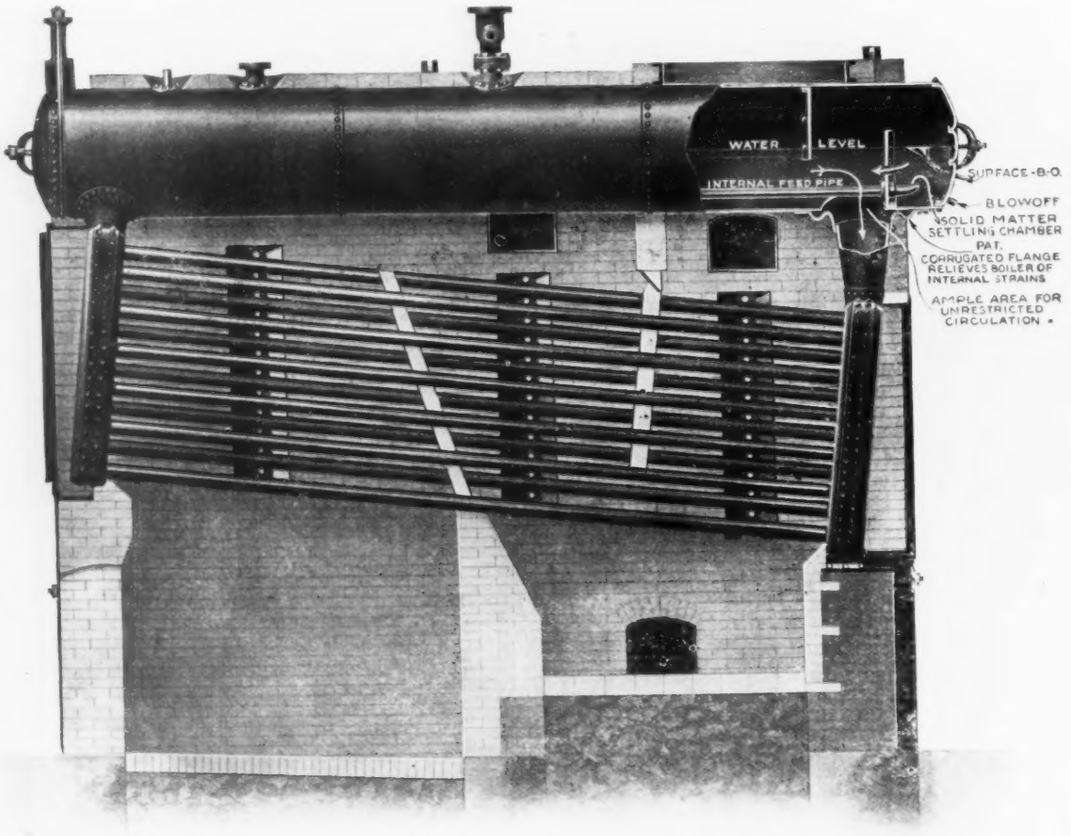
Flexible corrugated connection at rear header absorbs expansion and contraction and prevents leak and undue stress.

Easily accessible for cleaning both internally and externally.



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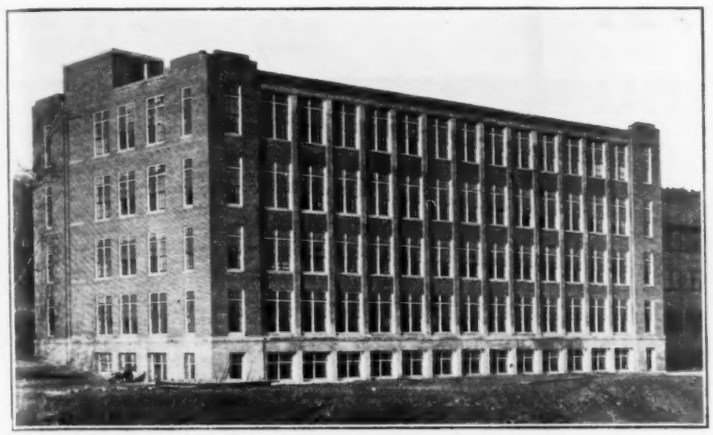
68 ft., four stories and basement. It is to be used for combing, spinning, drawing and twisting. The arrangement of the machinery is such as to work in nicely with the layout in their present buildings. The addition has steel columns, steel beams, wood floors, wood sash and brick walls, and is fully equipped with toilets, elevators, etc.



New Yarn Mill of Star Worsted Co., Fitchburg, Mass.

Multiple Winding Co.

One of the most successful small plants designed during the last year is the building for the Multiple Winding Co., of Malden, Mass., manufacturers of multiple and electrical insulating yarns. This building is 70 ft. by 85 ft., two stories in height, and is of steel, timber and brick construction. The first floor, which is on the ground, is of concrete. The first story is to be used entirely for the receiving, storage and shipping of goods. The second floor is to be occupied by the manufacturing space. The building is equipped with factory offices, dressing rooms, coat rooms and toilets.

Amazon Cotton Mills Enlarged

Erect Addition and Will Install New Machinery to Double Output of Yarns

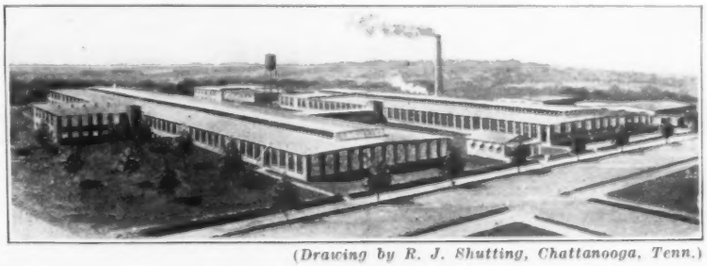
AMAZON Cotton Mills of Thomasville, N. C., are making additions to plant and equipment which will enable them to almost double the output of fine cotton yarns. They are building to the main mill an addition that is one-story high, 132 by 489-ft., as well as a one-story addition to the picker building, 62 by 105-ft. Standard mill type construction with daylight steel sash is being used in these buildings. The large addition to the main mill also has a long monitor on the roof which will afford excellent lighting in the center of the building.

In the accompanying illustration the old mill appears on the right and the new additions on the left. A covered passageway connects the two buildings at about the middle of the length of the original mill and provides for transporting materials in process between departments. It will be noted that the same general lines of mill architecture have been followed in the addition to make it harmonize with the older mill, and that the engineers have planned the development to give a compact, efficient plant, with the maximum daylight on all sides.

It is the intention of the Amazon Cotton Mills to use the present mill building for spinning and twisting equipment, while all preparatory machinery will be transferred to the new building. Straight line methods will be used in handling stock which will pass through the preparatory machinery in the new buiding, then be carried across the passageway to the spinning and twisting frames in the old building.

Due to the rearrangement of machinery, Amazon Cotton Mills will get about double their present production, though it is stated that it will not be necessary to double the present equipment to achieve this end. The mill now has 12,528 ring spindles and will add to these 8,000 new ring spindles built by Whitin Machine Works. New pickers and cards built by Saco-Lowell Shops, and new roving frames built by Whitin Machine Works will also be installed. Equipment will be motor-driven throughout.

Engineers in charge of construction and machinery rearrangement for Amazon Cotton Mills are J. E. Sirrine & Co., Greenville, S. C. The buildings are being erected by J. A. Gardner, contractor, Charlotte, N. C.



(Drawing by R. J. Shutting, Chattanooga, Tenn.)

Amazon Cotton Mills; New Mill at Left

New Mill of Kent Mfg. Co.

Replaces Two Old Buildings—Interesting Conveyor Installations for Handling Stock, Roving and Yarn

By *Russell H. Kent**

THE Kent Manufacturing Co., has been engaged in the manufacture of woolens since 1843, and worsteds since 1920. Today is operates 5 mills located in Clifton Heights, Pa., and Bedford, Va., The new building was constructed to replace two old buildings on the same site. Of the latter, one was built in 1822, and was three stories high; the other was a four-story structure with attic, under pitched roof, and was built in 1865.

It is interesting to note that these old buildings were erected before cement was a commercial material; the mortar appeared to be of sand, not well selected or suited to the work and lime. The old girders were white pine, 14 by 18 by 52 ft.; the posts and many of the joists were of solid oak. This all seems extravagant to us in these days and teaches a lesson demonstrating the need for us today really to practice conservation. The third story contained 36 looms of 92-in., reed space, placed crosswise to the length of the building. The fourth story contained eight 360-spindle mules and the attic contained four 360-spindle mules, all of which were, of course placed lengthwise of the building.

The mules with their carriages running to and fro to the transverse dimension of the building for so many years, and aggravated by the loom vibration, seemed to destroy all bond in the mortar. The finger rubbed against it would remove a fine dust, and indeed the walls themselves had settled vertically as well as assuming a decided bulge toward the creek. Being built on a hillside on sloping rock, the writer has often wondered if the rocks themselves might not have moved a few inches in so many years and caused the bulging referred to above.

New Building

The new building measures 78 ft. by 187 ft., 5 stories, with 12-ft. ceiling heights. Irwin & Leighton, contractors, Philadelphia, did the construction work and in collaboration with the mill organization, designed it to suit the machinery. The factory organization designed and installed all of the steam, water, heat, electric and power appointments, etc.

The building lies almost exactly east and west and thus receives the north light broadside. The roof is provided with four sawtooth style skylights. A 4-ply pitch and felt slag roofing is overlaid upon 2 in. T & G roofing boards. Except for the sawtooth arrangement, the roof is nearly flat, but with a slight drainage grade toward gussets at the eaves. The southwest corner is extended to form the tower containing concrete stairways and floors, an elevator in a stone masonry shaft, and toilets. All the communicating entrances are provided with self-closing fire doors, and balanced steel vertically sliding doors for the elevator shaft.

Plumbing Fixtures

The Vogel factory closet is used throughout as it had proved from past experience to require the least amount of maintenance and is almost proof against meddlesome tampering. Large vitreous urinal floor stalls are provided in the men's rooms. Each room also contains two vitreous enameled iron wash basins. The rooms are ample for twice the number of operatives, according to the Pennsylvania State rulings.

The entire mill is sprinkled in the usual approved manner, water being supplied from an already existing high tank and pump system. The heating is by 1-in. pipe coils hung from ceilings. The first floor, however, is heated and ventilated by the unit system as developed by the York Heating and Ventilating Co., Conshohocken, Pa., the units containing steam heated coils, each having a fan mounted on top which draws air from outisde and delivers to the room. Two of these units are used, one at each end of the room. Two exhaust fans are placed in the middle. The wet finishing machinery is placed in this room, thus requiring adequate ventilation.

The machinery was placed so as to have the materials move in one direction as far as possible, and so a down feed was selected. The top floor contains the 10 sets of 48-in. woolen cards, which are placed in train transversely to building. There is space for two more sets for future requirements.

Wool Distribution

An interesting and I think absolutely unique wool distributing system has been developed. The picker house lies across the creek to the north and is about 125 ft. distant. This is a fancy mill with almost innumerable styles of mixes, colors and types of wool. A blower receives wool directly from the second Fearnaught mixing picker and by means of a pipe system and switches can

* Engineering Dept., Kent Manufacturing Co., Clifton Heights, Pa.

Counting the Cost Before Manufacturing is Begun

First after the fixed overhead cost in the plant comes the cost of Raw Materials; and a very important element in Raw Material cost is Transportation, which depends on the facilities available and the length of the haul.

Raw Materials Cost Less in the South

The Cotton is raised in the South; and, naturally, it can be delivered to the mills in the South at less transportation cost than to mills in other sections. This consideration alone has already brought many cotton mills into the South; and the movement grows. With the South's vast resources being developed increasingly, there is ample room for many more mills.

Consider the South – To Your Profit

Besides cheap Raw Materials, the South offers cheap Labor; ample Water Power; Fuel—coal, oil and gas; a mild Climate, and water and rail Transportation to the markets of the world.

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The L. & N. Railroad has no land to sell; but it has a vast store of valuable information to give freely, without charge, to factory owners who may be interested in Southern locations. Write for it.

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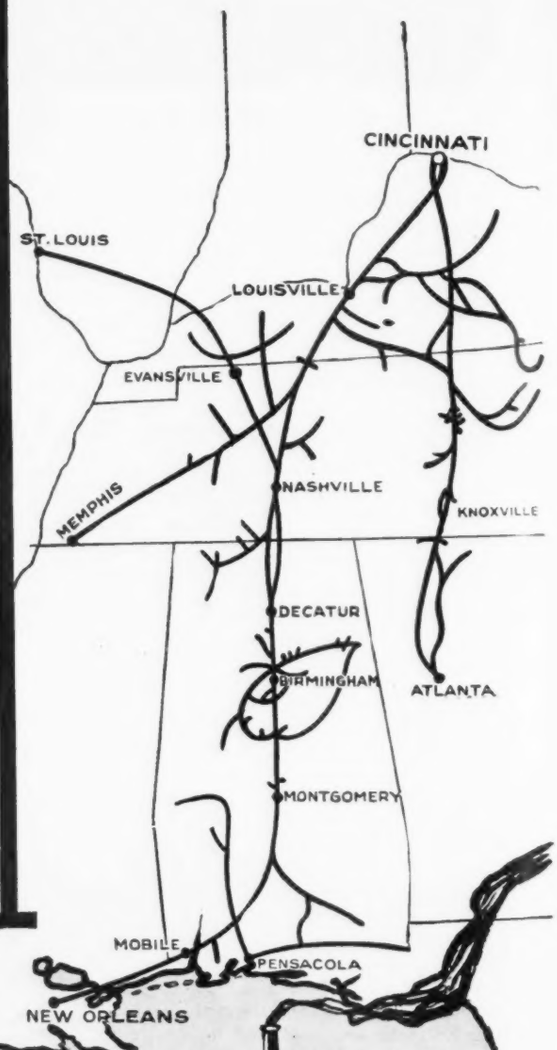
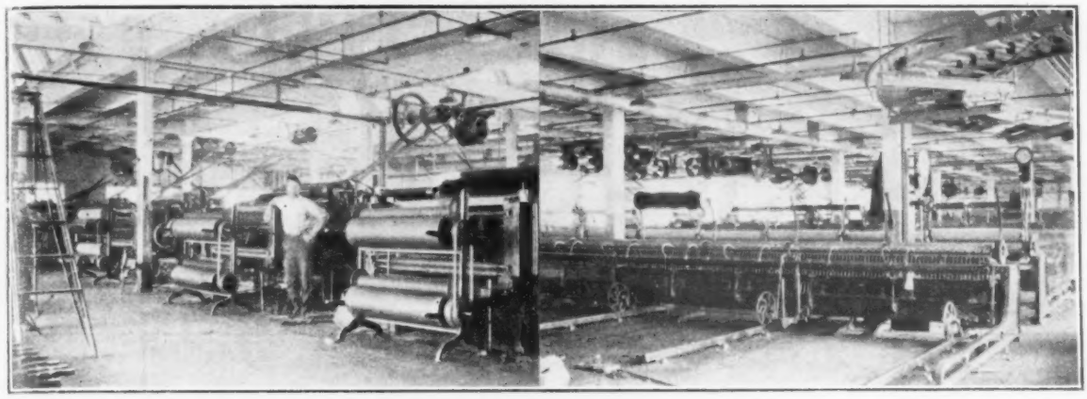
Traverses the Heart of the South; and offers cheap and adequate transportation over its 5,000 miles of tracks, entering thirteen states.



L&N
(LOUISVILLE & NASHVILLE R.R.)

THE OLD RELIABLE

deliver it to any one of about fifteen different bins. Another blower has its suction line connected to a similar system of pipes which have hopper inlets, each of which is controlled by a damper or blast gate. Every gate is kept closed except the one in use. Wool from the bins can be dropped into these hoppers conveniently located in front of the bins. It is then whisked away through the blower into the card room and is there distributed by switches into individual bins located back of the automatic Bramwell card feed box. The operatives keep the boxes full by hand.



At Left, Card Room: at Right, Spinning Room in Kent Manufacturing Company's New Mill. Conveyors are Installed for Handling Raw Stock, Roving and Yarn.

The wool pipe system can supply also by means of switches, another mill located somewhat nearer the picker house, but the method of distribution is the same.

The roving spools are removed from the cards and placed in racks made of iron. Each rack is square, holding 20 spools, and thus with several racks considerable storage is provided. They rotate easily about a vertical shaft and can be loaded into the cradles of the Lamson Company conveyor system, delivering them to the mule room on the floor below. Another Lamson-conveyor receives backets of yarn from the mules and conveys them to the weave room on the floor below.

The weave room has no special features to mention here. However, the cloth after measuring, examining, etc., is dropped into a chute to the mending and burling room below. A second chute is provided to take the cloth already tacked and deliver it to the first floor, in which the wet finishing operations are performed.

Power and Lighting

The mill is lighted by 100-watt lamps placed 9 ft. 6 ins. or 10 ft. on centers, and the filament approximately 10 ft. above the floor. Where weaving operations require it, 150-watt lamps are used. The system was used in older parts of the establishment and found to be highly satisfactory. It is to be noted that the lamps are placed in total disregard of the location of machinery, the theory being that if the room is uniformly lighted, without bright or dark spots, there will be no shadows. This is found to be practically true in use. It is really better than daylight since every day it is the same without regard for the condition of the sky, or the position of the sun, which varies greatly from one season to the next. Lamps are provided with reflectors known as the B. E. D. D. and thus the eye is protected from the direct rays of the filament.

The power is provided by Skinner Universal Uniflow engines operating non-condensing, direct connected to 440-volt, 3 phase, 60 cycle engine type alternators with direct connected exciters. The generators are arranged to operate in synchronism but due to the mill conditions it has always been found advisable to operate individually on two 3-phase busses. Each mill operates with one engine but either can be switched over at will. The power lines are carried aerial to the mill and then in rigid iron pipe conduit.

Except for a distributing panel for each mill and on loom motors there are no fuses used. Each motor is provided with a starting switch or if 7½ horsepower or greater, a starting compensator, which is fully protected by under-voltage and overload release. For many of the motors flexible steel 3 BX conduit is used for convenience, saving installation labor and time.

Water System

The factory is served by an underground water system of 8 in. C. I. Class B bell and spigot pipe, using oakum and lead joints throughout. A reservoir tank is floated on the line. The source of supply is a head race from which a centrifugal motor driven pump delivers to a sedimentation tank. Pure aluminium sulphate is fed to the pump discharge line, its purpose being to cause quicker sedimentation and it aids in the subsequent filtration. The filters are Permutit Co., capacity 300,000 gallons in ten hours. The pumps are American Well Works Co., direct connected motor driven centrifugal double suction, 1750 R. P. M., and have an efficiency of over 70%. One has a capacity of 700 gallons per minute and the other of 400 gallons per minute. A separate pump for backwashing for filters is provided.

Hot water is supplied from the power house in a separate pipe system. Instead of the usual heater for boiler feed supply only, an unusually large heater from H. S. B. W. Cochrane Corporation supplies to the boiler feed pumps and also to the hot water service pump. Located below the engine room floor is a centrifugal pump of 200 gallons per minute which is supplied from the heater. A Sarco temperature regulating valve is inserted in the pump discharge line. If exhaust steam is insufficient at any time to maintain 195 degrees F., the regulating valve reduces the pump discharge; or if an excess of steam be available, the valve opens to full discharge. Equalization of pumping to the needs of the factory is taken care of by a large wood tank for reservoir.

A feature carried out in all the piping work, whether water, steam or exhaust, is that all joints are welded; tees are also welded where branches are required. The factory organization has developed this during the last eight years so that very few of the old-fashioned threaded joints remain.

The mill is heated by the exhaust not consumed in the feed water heater which is used at ½ to 1 lb. back pressure. The 8 in. heating main enters the mill, where it is reduced as the steam is divided. Kennedy gate valves are used throughout on the heating system. Each radiator or coil is fitted with Warren Webster & Co. vacuum traps. All are connected to a vacuum drip main which returns to the power house.

Motor and Chain Drives

All looms are driven by individual textile loom motors from the General Electric Co., 1750 R.P.M., geared to the loom clutch. The cards, mules and finishing machinery are driven in groups, using a Morse chain between the motor and line shaft. Other machinery is driven either in groups or individually according to convenience. There are also a few belted connections.

Firth Carpet Co., Auburn. N. Y.

New Finishing Building and New Machine Shop Erected as a Step in Plant Development

By *Henry Manley* *

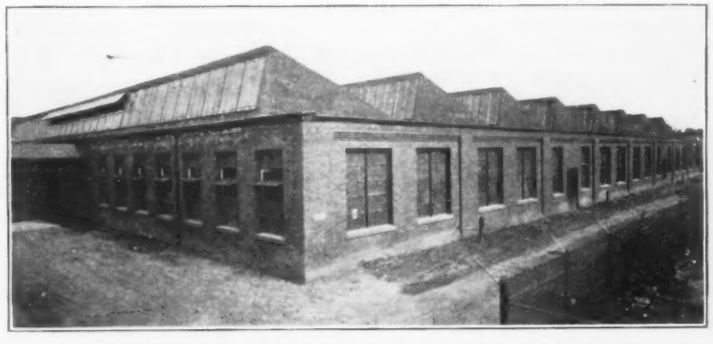
NEW construction for the Firth Carpet Co., Auburn, N. Y., consists of a new finishing building, a new machine shop, and additions to the existing boiler house and dye house. With the exception of the two-story machine shop, all of the buildings are of one-story construction, following the general lines of the original buildings, and constituting an intermediate stage in the development of the plant as a whole.

This plant is devoted to the manufacture of chenille and Axminster rugs from purchased yarns, which are scoured and dyed at the plant. Dyeing is performed in a monitor type, trussed roof, brick, steel and timber building which in turn is supplied with steam by a battery of horizontal tubular boilers housed in a clear span, steel trussed, pitched roofed, brick, steel and timber boiler house. Manufacturing and finishing take place in sawtoothed buildings of brick, steel and timber construction which furnish ideal conditions for the majority of operations and permit of the rearrangement of departments when demanded by expansion, without injury to the working conditions.

Finishing Building

The new finishing building is of one-story sawtoothed construction,

*Lockwood, Greene & Co., Engineers, New York.



New Finishing Building of Firth Carpet Co., Auburn, N. Y.

EFFICIENT
COAL HANDLING SYSTEMS
FOR TEXTILE MILLS

From Cars to storage and boiler room—quickly—and with practically no manual labor involved.

We specialize in the design and installation of elevating and conveying machinery that will effect many important savings for you all along the line:—retrieving profits that other methods let slide into the waste-heap of lost motion, demurrage and excessive maintenance costs.

We carry in Stock for immediate delivery complete sets of V Bucket Elevators, Belt Conveyors and parts for same.

Coal handling machinery installed of every description in complete working order.

GEORGE P. CARVER Inc.

ENGINEERS - CONSTRUCTORS

261 FRANKLIN ST. BOSTON, MASS

approximately 153 ft. by 216 ft., with brick side walls, metal side wall sash, and covered with a plank roof supported directly on wooden trusses which in turn are supported by steel beams or flat trusses resting on cast iron columns. The roof is insulated as follows: Over the plank, one ply of roofing is carefully mopped in place. On this, 2 in. by 2 in. wooden strips are laid which support a ⅞ in. matched wooden outer roof, which provides a 2 in. dead air space. The outer roof is covered with the regulation tar and slag covering. The sawteeth are equipped with wooden sash, one-third of which have ventilating sections as shown in the illustration. These sections are operated by gang adjusters, permitting the rapid closing of all openings in case of sudden storms. Copper flashing is used throughout.

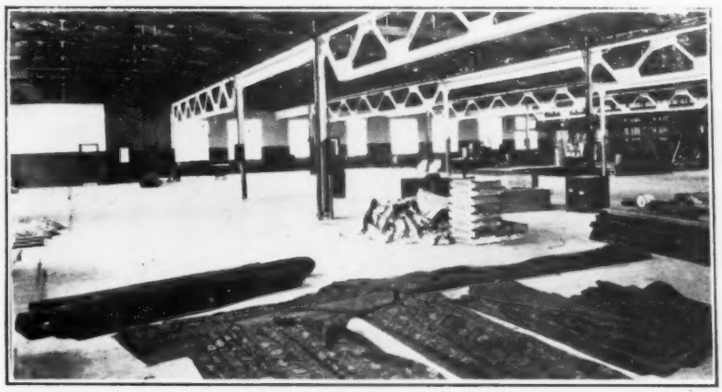
The interior of the building is cut up into bays 25 ft. by 26 ft. 6 in., with interior column foundations at each corner. These provide for an overhead structure capable of supporting shafting or chains for an Axminster loom. As the present use of the building is for finishing purposes, where large bay spacing is of great importance, intermediate columns have been omitted in many instances, a light truss substituted for the heavy beams, and the head-room somewhat reduced. This construction is shown by the illustration. Should it become desirable to utilize this building for looms instead of for its present purpose, additional columns may be inserted on the foundations in place, the truss removed, and beams substituted without serious disarrangement of the present structure.

This building is used for the finishing and storage of Axminster and chenille rugs. These are brought from the looms in hand trucks through a covered passageway and undergo the usual shearing, backsizing, steaming, drying, mending and binding operations, and are stored at the extreme end of the building for shipment. Future tracks on the east and west sides of the building will provide shipping facilities. Toilet and rest room space is provided in the northeast corner of the finishing building for both male and female employes, well equipped with modern plumbing, slate partitions and substantial fixtures.

Machine Shop

The two-story machine shop is a happy utilization of an irregular lot corner. The building is sited over a covered reinforced concrete reservoir, and is constructed with brick side walls, steel interior framing, and plank floors and roof. Steel sash provide ample light. The ground area is approximately 53 ft. by 56 ft. The first floor is used for machine shop purposes with one section divided off with a fireproof partition for use as a forge shop. The machine shop proper is floored with creosoted wood block, while the forge shop is floored with brick. The second story is floored with maple over the plank, and is used as a pattern storage and carpenter shop.

As stated above, these buildings constitute an intermediate stage in the development of the entire plant. The effort has therefore been to maintain a type of construction which will be adaptable in as many ways as possible to the indeterminate future expansion. The sawtoothed roof, together with the column spacing and the method of providing extra wide bays for present conditions, is a happy and successful compromise.



Interior of Finishing Building; Note Extra Wide Bays for Handling Large Rugs.

Dover Mill Co. Completes Plant

Will Produce Print Cloths and Shirtings—Has 11,000 Spindles and 262 Looms

DOVER MILLS CO., of Shelby, N. C., has completed its cotton mill which will produce print cloth and shirtings. This new mill was built as a result of enterprise and initiative of citizens of Shelby. The Shelby Kiwanis Club took the lead in securing subscriptions to stock. J. R. Dover, successful mill executive of Shelby, is president of this new mill which bears his name and of the Eastside Manufacturing Co. Dover Mills Co. is capitalized at $500,000.

The new mill is three stories, 107 x224 ft., flat slab reinforced concrete construction througout. Truscon steel sash is used. The card room is located on the top floor; spinning on the second floor; and spooling, wraping, slashing and weaving in the first floor.

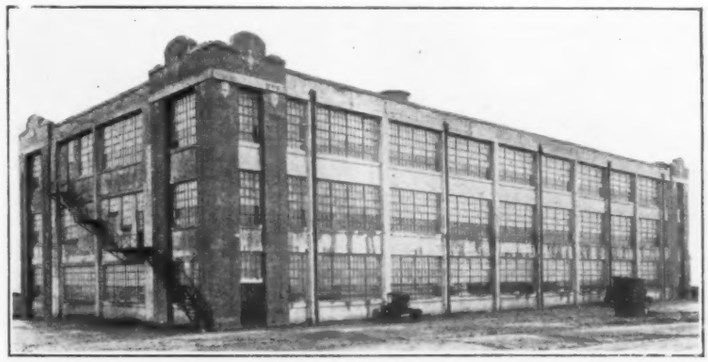
This new mill is equipped with 11,000 ring spindles and 262 Draper automatic looms with dobby heads. Spinning frames were built by Mason Machine Works which also built the cards and drawing. The pickers and roving were furnished by Saco-Lowell Shops. Curtis & Marble equipment is used in the cloth room.

The mill is operated by purchased electric power, the machines being driven by Allis-Chalmers motors. Individual motors are used in the picker room, 7½ horsepower on the breakers and 5 horsepower on the finishers. The roving waste machine is equipped with a 10 horsepower motor. Cards are group driven, each motor driving one line of shafting through a chain drive. The drawing frames are equipped with 5 horsepower motors. The roving frames are driven by two and four-frame motors, the former being 7½ horsepower and the latter 15 horsepower. Ten horsepower motors are used on the cloth room machinery and on the slasher and fan. Other motors include: one size kettle and warpers, 5 horsepower; on spinning frames, 7½ horsepower; on spoolers, one horsepower; on looms, ½ horsepower individual loom motors.

The humidification system is furnished by the American Moistening Co. and the sprinkler system by the Globe Automatic Sprinkler Co.

The houses in the Dover Mills' village are of the semi-bungalow type and equipped with modern conveniences, including electric lights, running water and sewage facilities.

J. E. Sirrine & Co., Greenville, S. C., are the engineers for the Dover Mills Co. The general contractors were Fiske-Carter Construction Co. of Greenville, S. C., while the electrical contractors were Michael & Bivens of Gastonia, N. C. Roofing contract was handled by J. A. Piper Roofing Co., Greenville, S. C.



Plant of Dover Mills Co., Shelby, N. C.

Wade Manufacturing Company

New Cotton Flannel Mill at Wadesboro, N. C., Nearing Completion—Second Unit to be Built

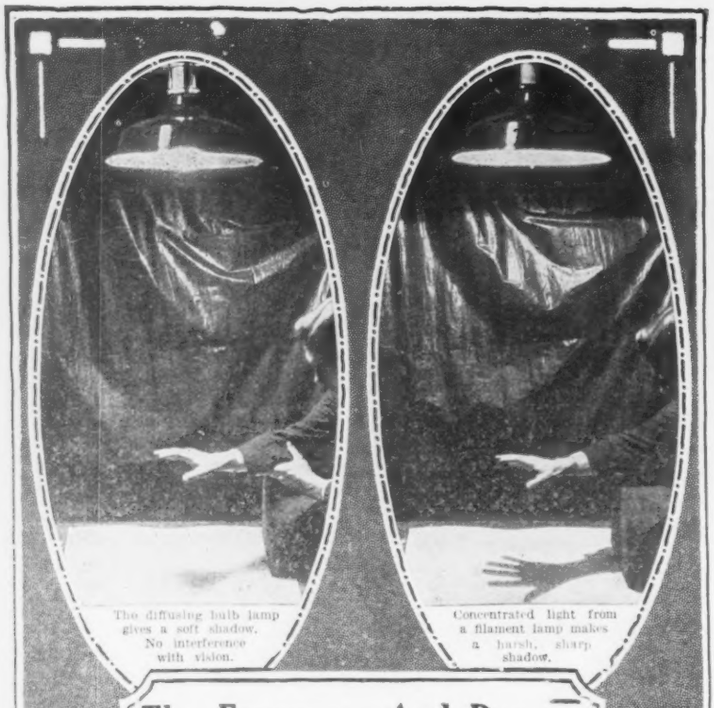
ORGANIZED by prominent men of Wadesboro the new 14,000 spindle textile mill for the Wade Manufacturing Company at Wadesboro, N. C., is one of the most interesting developments in the South this year, both from a textile and an engineering standpoint. Being located in the heart of the North Carolina cotton belt and in close proximity to other large textile interests, Wadesboro is destined to develop into quite a manufacturing center. Plans are already being formulated looking toward the building of a second unit.

In selecting a site for this new mill, careful study was given not only to railroad facilities and the natural topography, but to the water supply as well, inasmuch as a dye plant was to be a part of the complete development. After options had been secured on several possible locations, Robert & Company, Inc., architects and engineers of Atlanta, were engaged to handle the complete engineering services and definitely approve one of the sites.

As the water supply was such an important prerequisite for the dye plant, the mill was located on a 400 acre tract of land just outside of the corporate limits of Wadesboro, N. C., on the State highway to Hamlet. The site is served by both the Seaboard and Atlantic Coast Line Railroads. A stream, fed by springs traverses the property and in order to insure against a possible shortage of water, a large impounding reservoir of approximately 6,000,000 gallons was created by constructing an earth dam 200 feet long across an existing ravine.

Includes Dye Plant

This new development is a 14,000 spindle plant to make cotton flannels, with 400 looms. The mill is equipped to do all of its own dyeing and napping and through every process only the latest and most modern equipment is being used. The building program consists of a two-story spinning mill



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Concentrated light from a filament lamp makes a harsh, sharp shadow.

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2. Fatigues the eye.	2. Is evenly distributed—it flows gently in from all sides.
3. Requires greater care—and time—to obtain accuracy.	3. Insures speed and accuracy.
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5. Is confusing—and dangerous.	5. Is pleasant and satisfying.

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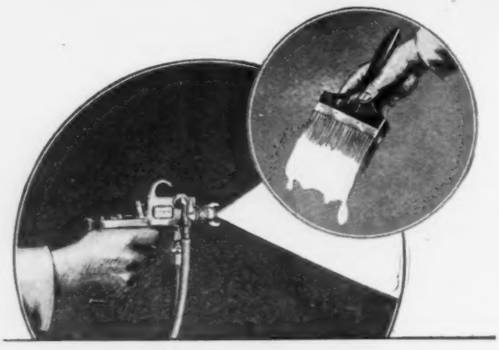

Comparing Costs Shows 80% Saving

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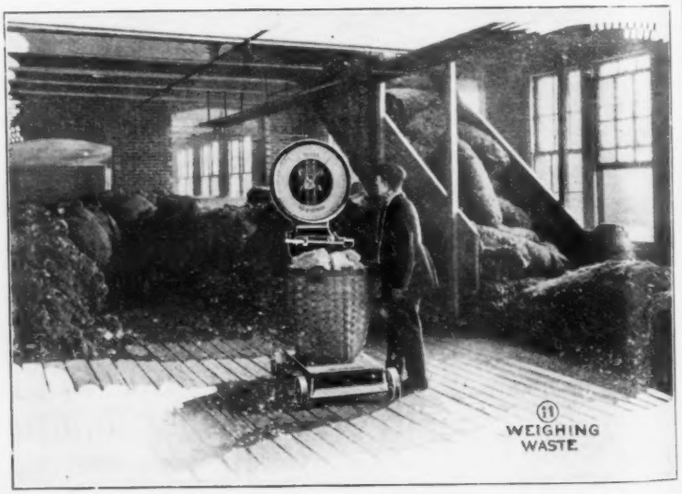

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245 ft. long by 100 ft. wide, with a weave room 290 ft. by 100 ft., in tandem. The napping room is built parallel and adjoining the weave room and the dye house is located centrally, parallel and in the rear of the main building. Immediately adjoining the dye house is the boiler room which furnishes heat to the whole plant and steam to the slashers and dyeing equipment. The machine shop and supply room are located in the basement of the main building where it serves the whole plant, all communication being made by means of the main elevator.

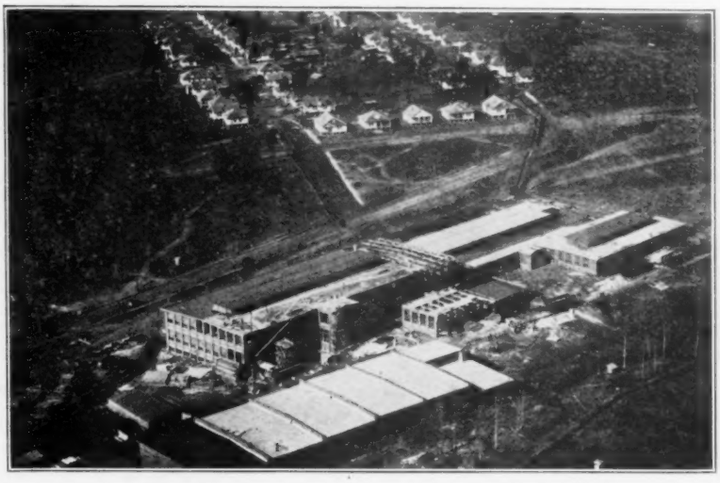
The auxiliary group, which consists of the opener room, waste room, and four sections of warehouses, are located in the rear of the main building and are served by a spur siding of the Atlantic Coast Line Railroad. A bonded warehouse of six sections, which is controlled by the mill, adjoins the mill's warehouses and insures ample cotton storage at all times.

All of the textile machinery, which is being furnished by Saco-Lowell Shops, is so arranged that the processes are in continuous progression, the pickers, cards and roving being located on the second floor and all the spinning, warpers, slashers and looms on the first floor. All of the looms are individually motor driven and are being furnished by the Draper Corporation.

Water Supply System

The water supply system for this plant presented quite an interesting problem as the only primary supply was from deep wells. To provide for all the service water for the mill and village, deep wells were bored and pumps provided to supply large steel standpipes which are located on the highest point of the property. One of the standpipes is reserved entirely for service water, while the other is an auxiliary supply for the fire protection. The primary supply for the fire protection is the 6,000,000 gallon impounding reservoir and the auxiliary standpipe is used only to keep water on the mill sprinklers and the village protection.

Another interesting feature of this development is the location and layout of the village, which contains 102 houses. Being located on a high ridge, paralleling the mill, and between two rows of houses, each house being served by laterals. All of the lines flow by gravity to a



Cotton Flannel Plant Under Construction for Wade Manufacturing Company.

the site presented unusual possibilities, and in laying out the streets every advantage was taken of the topography so as to get a pleasing appearance in the village. Curved streets were adopted wherever possible and all grades kept to a minimum. All of the houses are of a bungalow type and each house is provided with electric lights, water and sewage connection. Instead of using bath tubs, all of the houses are equipped with shower baths.

The sewage problem was solved by running trunk lines in the rear disposal plant located some distance from the village, which discharges into a live stream.

The Wade Manufacturing Co. has its offices in Wadesboro, the officers being T. C. Coxe, president; I. B. Covington, vice president and general manager; James Leak, vice president; and W. Henry Liles, secretary and treasurer. T. C. Thompson & Bros. of Charlotte are the building contractors for both mill and village. Robert & Co., Atlanta, are the architects-engineers.

Beswick & Clay Co., Inc.

Build New Woolen Yarn Mill, Dye House and Boiler House in Philadelphia — Purchase Power

SEVERAL distinctive features are to be found in the modern plant which was constructed for Beswick & Clay Co., Inc., woolen and merino yarn spinners, Philadelphia, during 1923. Work is now practically completed and the equipment will soon be in operation. The location is at 68th St. and Greenway Ave. on a plot of about three acres, with ample room for further expansion. The design and construction were in charge of M. Ward Easby, Inc., constructing engineers, Philadelphia, who gave special attention to the requirements of their client in planning the construction and equipment of the mill so that the greatest eventual saving would be effected while at the same time maximum efficiency was secured.

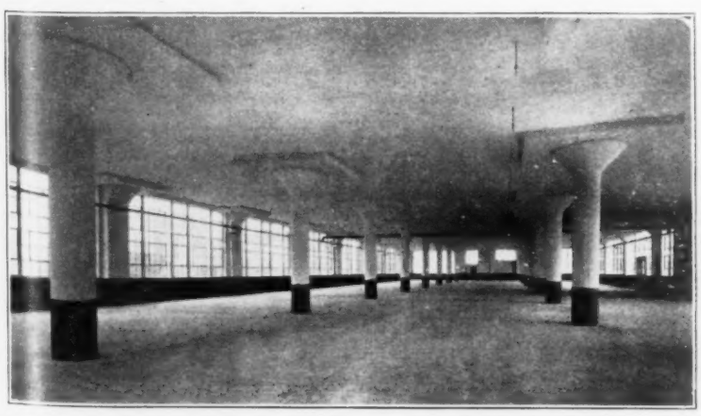
The main building of the plant is a two story and basement building, 255 ft. long by 89 ft. wide, of reinforced concrete flat slab construction. The building has been designed to admit of the future addition of two more stories if desired. In order to accommodate the proper installation of the wool cards and spinning mules, the plans provided for what is declared by the engineers to be the largest span in flat slab construction to be found in Philadelphia. Here the span is 28 ft. 2 in. by 29 ft. between the columns, whereas the average span in this type of construction is from 20 to 24 ft. In keeping with these dimensions, the slabs are 12 in. thick, the average usually being about 8 in., so that ample provision is made to carry the weight.

By using this plan the engineers were able to effect a considerable saving of floor space in the laying out of the machinery. The top floor will be used for the spinning mules, while the first floor will contain the cards, winders and twisting department, as well as the offices of the company. Ample light is provided in the center of the building, there being 17 ft. 4 in. from floor to floor, with the steel sash running to the ceiling. The basement will be used for storage.

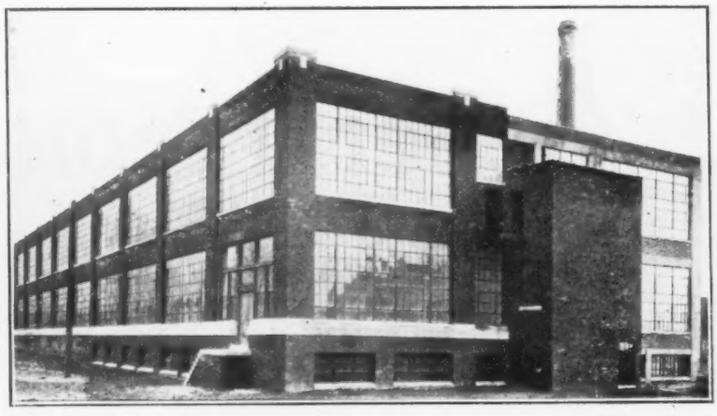
Dye House and Picker Houses

There is also a dye house which is one story, 44 ft. by 80 ft. of slow burning construction, with truss roof with lantern for ventilation. This type of construction was used because of the experience of the constructing showing that the steam and vapors in time affect the steel work, causing deterioration. For that reason wood sash is also used throughout this building. A pit has been provided, 30 in. deep, along one side of the dye house for the dye tubs, affording greater convenience and saving labor, at the same time avoiding excessive wetting of the floor. New Hussong dyeing machines for both stock and yarn dyeing are to be installed.

There are also two picker houses, each 18 by 56 ft., one story in height, and both enclosed within fire walls to overcome the fire risk in this department. There is also a boiler house, 34 by 44 ft., with a 200 horsepower boiler. Space is provided for the installation of another boiler when required, as well as a generator if desired. For the present electric power will be purchased.



Second Floor Interior; Beswick & Clay Plant



New Woolen and Merino Yarn Mill of Beswick & Clay Co., Philadelphia

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Mill Construction Report

(*Continued from page* 433.)

apiece. In the artificial silk field Cupra, Inc., Clifton, N. J., started production in its new plant, and the Viscose Co. completed its projects at Lewiston, Pa., and at Roanoke, Va., and started preparations for an additional plant at Tacony, a suburb of Philadelphia.

Of the miscellaneous mills, 16 are dyeing, bleaching and finishing concerns. The most important of these are located in the South and are tied up with gray goods mills. There are, however, four large finishing companies of the North which are going into the southern field.

Following are detailed reports of new mills, enlargements and improvements:

Detailed Report of New Mills

NEW COTTON MILLS

Alabama, Geneva. Geneva Cotton Mills; new mill, 312 x 106 feet; initial equipment to consist of 5,280 spindles and 164 looms; will start operation about March 1, 1924.

Opp. Micolas Cotton Mills; initial equipment 7,200 spindles and 190 looms; 30 houses for operatives.

Arkansas, Jonesboro. Jonesboro Cotton Mills Inc.; organized with authorized capital of $600,000; about to start building 125 x 600 foot mill, two 50 x 100 foot warehouses and about 75 houses for operatives.

Pine Bluff. Jefferson Cotton Mills Co.; incorporated with capital of $500,000; remodel existing plant for wide sheeting production.

California, Huntington Beach. California-Pacific Textiles, Inc.; capitalized at $1,500,000; plans for early construction of tire fabric plant to be three stories, 80 x 200 feet and equipped with 10,000 spindles; W. A. Golden, president.

Los Angeles. Ironall Cloth Co.; erect new mill costing $500,000 with equipment.

Los Angeles. Los Angeles Cotton Mills; organized with capital of $1,000,000, will start building when all stock has been subscribed; three-story concrete mill, 800 x 450, to be equipped with 40,000 spindles and other machinery for production of sheetings and casings.

Los Angeles. Pacific Cotton Mills; a 10,000-spindle mill on 8s to 30s yarns; plan to be in operation by April 1, 1924.

Mountain View. Interstate Textile Mfg. Co.; propose to erect mill for production of sheetings, shirtings and ginghams; 160,000 spindles and 4,000 looms.

Orange. Bear Rope Products Co.; new plant on cotton and jute twine and rope; 20 braiders.

Connecticut, Bridgeport. Samuel Lowndes; erect new plant at 40 Union Ave., for manufacture of elastic webbing, etc.; one-story, 32 x 113 feet, frame and concrete.

Middletown. F. & M. Fabric Co., 20 William St.; incorporated with capital of $50,000; start manufacturing elastic and non-elastic braids and cords; equipped with 350 braiders; plan to manufacture a special fabric later; John Feulner, president.

Middletown. Wilcox Lace Mfg. Co., headed by A. G. and Edwin Wilcox; start manufacturing in one-story frame building, 42 x 38 feet, on Water St.

Norwalk. Norwalk Braid Co.; incorporated for $560,000; incorporators are: Arthur C. Wheeler, 6 Arch St., Norwalk; M. J. Root, New York, and C. T. Tristram, Norwalk.

Old Lyme. Art Lace & Braid Co.; new plant; $50,000 capital; 4 looms, 100 braiders; F. L. Powell, president.

Delaware, Newark. Baldwin Mfg. Co., velours, 20 looms (branch of Elk Mills, Md.)

Georgia, Hogansville. Stark Mills (controlled by recently formed New England Southern Mills); new plant having approximately 260,000 square feet of floor space; also storehouse and boiler plant, and about 100 houses for operatives; about 20,000 spindles owned by International Cotton Mills and formerly located in their plants in Lowell, Mass.; Newburyport, Mass., and LeRoy, N. Y., have been moved here; new machinery also installed; will start operations early in 1924.

Indiana, Indianapolis. Habig Mfg. Co.; acquire factory of Glover Equipment Co., Meridian and Eleventh Sts., and establish plant for manufacture of fabrics for automobile service; E. E. Habig, heads company.

Indianapolis. Indiana Mattress Co. (subsidiary of Specialty Mattress Co., Huntington, W. Va.); capital, $150,000; start manufacturing at 806-10 N. Senate Ave.; 2 garnetts and 3 pickers.

Louisiana, New Orleans. Foster Mfg. Co.; erect plant for manufacture of cordage, canvas goods, etc., on Julia Square.

Maine, Westbrook. Wm. W. Edgerton Fabric Co. of Boston; start mill on cord tire fabric; 4 special looms.

Massachusetts, Boston. Nickerson Narrow Textile Co., 564 Washington St.; established to engage in manufacture of tape, narrow binding, etc.

Bridgewater. Lapworth Webbing Co.; erect one-story mill at South and Crescent Sts., Hyde Park. Park Mills; openers of cotton, silk and wool threads; start operations at 60 Factory St.; 6 pickers and 6 garnetts.

Newburyport. Essex Cotton Mills; capital of $500,000; take over former plant of American Cotton Fabric Corp.

North Chelmsford. Richardson-Pevey Co.; start manufacture of tire fabrics.

Wellesley. Wellesley Textile Co.; capital $30,000; operates 4 looms on draperies.

Westfield. Standard Braid Co.; start manufacturing in Power building. Samuel Britton and H. D. Beman, props.

Michigan, Highland Park. Ford Motor Co.; prepare plans for establishment of mill for carding, spinning, weaving and dyeing cloth to be used as backing for artificial leather for seats and tops in Ford cars; will contain about 7,600 spindles and 200 looms.

Jackson. Michigan State Industries; plant at Prison Farm; weaving cotton colored goods, shirtings, denims, tickings and towels.

Minnesota, Minneapolis. Moorish Rug Mfg. Co.; 3 looms on rag rugs.

New Jersey, Mount Holly. Consolidated Textile Co., Inc.; start operation of new mill, manufacturing upholstery and drapery fabrics; four looms; later change name to Mount Holly Textile Co.

Mount Holly. Spada, Pierce & Co.; start manufacture of upholstery and drapery fabrics at Washington and King Sts.; 4 looms.

Passaic. Jacquard Weaving Association; organized by members of Titus, Blatter & Co., New York, who purchase jacquard weaving mill and start manufacture of sunfast drapery and upholstery fabrics.

New York, Brooklyn. Yazoo Mills, Inc., capitalized at $100,000; start manufacture of twines and thread at 612 DeGraw St.; William R. Berryman, president.

Dunkirk. Seneca Towel Mills, Inc.; $30,000 capital; start operation in three-story brick building on E. Third St.; 20 looms; Turkish and plain toweling; Myer Ballotin, president.

Fort Plain. Leroy J. Brandow; starts plant for manufacture of upholstery cloth for automobiles.

Mayville. Mayville Textile Mills, Inc.; start operations on S. Erie St. and plan for expansion; Leslie G. and Benjamin Graper, principal stockholders.

North Carolina, Balfour. Balfour Mills, Inc.; chartered with capital stock of $500,000; plan 345 x 312 foot slow burning mill construction main mill; two-story 100 x 100 foot cotton storage warehouse and 20 x 40 foot boiler house; initial equipment 10,000 spindles and 260 looms; Capt. Ellison A. Smyth, president; start construction about Jan. 1.

Belmont. Stowe Spinning Co.; erect mill for production of fine yarns; 22,000 spindles; S. P. Stowe, president.

Burlington. Burlington Mills, Inc.; capital $750,000; award contract for main mill 570 feet long, warehouses, office building and 70 cottages for operatives; 10,000 spindles and 250 dobby looms for manufacture of fancy dress goods; M. B. Smith, president; J. L. Love, vice-president; J. Spencer Love, secretary and treasurer.

Burlington. Queen Anne Textile Co.; capital $1,000,000; purchase site and building; initial equipment 100 6 x 1 and 4 x 4 box 30-harness dobby looms, with 46½-inch reed space; fancy dress goods and novelties; W. H. Moreton, president.

Charlotte. Insulating Yarn Co.; incorporated with $50,000 capital; manufacture insulating and embroidery yarns; J. C. Rankin, president.

Concord. Hobarton Mfg. Co.; new weaving mill, 80 x 200 feet, one-story and basement; 100 automatic looms for manufacture of ginghams.

Eagle Yarn Mills, Inc.; build fine combed yarn mill; 10,000 spindles; W. B. Puett, president.

Gastonia. Arkray Mills, Inc., start operation spinning combed and gassed yarns as fine as 120s (mill erected previous year); 12,576 ring and 8,000 twister spindles; L. L. Jenkins, president.

Gastonia. Priscilla Spinning Co.; start operation in new mill, equipped with 15,000 spindles for production of combed cotton yarns; room for additional 10,000 spindles; C. D. Gray, president.

Hemp. County Moore Mills, Inc.; start construction of plant to house 250 looms, also spindles and other necessary machinery; W. W. Cowgill, president and treasurer.

Hickory. Hickory Lace Braiding Co.; start manufacture of shoe laces, equipped with 250 braiders. J. M. Allred, president.

High Point. Millis Cotton Mills, Inc.; $250,000 capital; new mill; initial equipment of 6,240 ring spindles on 10s to 30s yarn; H. A. Millis, president.

Lenoir. Caldwell Cotton Mills; erect one-story spinning mill, installing 6,000 spinning, 3,000 twister spindles and preparatory machinery; village and warehouses.

Lexington. Wabena Mills, Inc.; start production of 8s to 12s single and ply yarns in new plant; J. H. Thompson, president.

Lincolnton. Rhodes-Rhyne Mfg. Co.; organized with $500,000 capital; erect one-story brick mill, 354 x 80 feet to house 3,000 ring spindles and 100 broad looms; D. P. Rhodes, president and treasurer.

Marshville. Marshville Mfg. Co.; 120 x 130 foot brick mill for manufacture of tire fabrics; 2,800 twisting spindles and 4 looms; S. M. Robinson, president.

Oakboro. Oakboro Cotton Mills; erect new mill on 40s to 80s combed yarns; 6,000 spindles; J. A. Groves, president and treasurer.

Rockingham. Leak Mfg. Co.; erect complete cotton mill with warehouse, dye-house, boiler room and village of about 70 houses.

Wadesboro. Wade Mfg. Co.; erect new mill and equip with approximately 14,000 spindles and 400 looms; village of 100 houses; W. P. Parsons, president.

Ohio, Norwalk. Mercy Dee Rug Co., 36½ E. Main St.; equip plant for production of braided rugs; also small dyeing outfit; C. M. Chase, president and treasurer.

Oklahoma, Tulsa. Tulsa Cotton Mills; $250,000 capital; start one-story, steel and brick plant for 20s to 36s yarn and 32-inch colored shirtings; 18,000 ring spindles and 600 looms; Dan Hunt, Sr., president.

Pennsylvania, Philadelphia. Alpha Textile Co.; start manufacture of upholstery trimmings at 18th and Belfield Ave., Germantown; three looms; F. G. Hulme, president and treasurer.

Philadelphia. Wissahickon Plush Mills; start manufacture of cotton plush at Creason St. and Ridge Ave.; Arthur Johnson, president.

Philadelphia. N. L. Textile Co.; start manufacture of wash cloths, draperies and upholstery goods in one-story building, 32 x 60 feet, at 4465 Hawthorne St., Frankford; W. A. Daniels, owner.

Rhode Island, Pawtucket. Charles H. Bodell; start manufacture of laces in new mill on Lee St.

Pawtucket. Rhode Island Web Co.; start manufacture of elastic webbing in two-story mill, 40 x 110 feet; R. H. Meehan, president.

Providence. East Providence Mills, Inc.; start operations at 19 Grosvenor Ave., equipped with braiders and 16 looms; P. M. Remington, president.

South Kingston. Peace Dale Braiding Co., (affiliated with Columbia Narrow Fabric Co., Shannock, R. I.); $50,000 capital; start production of elastic braid in three-story mill, 115 x 48 feet; 100 braiders; George P. Clark, president.

South Carolina, Laurens. Palmetto Mfg. Co.; capitalized at $75,000; start weaving mill, producing fancy print goods; E. D. Easterby, president.

Lyman. Pacific Mills; group of large spinning, weaving and finishing mill units; 32,000 spindles with accompanying preparatory machinery and looms; product chiefly wide sheetings; also build 305 houses in mill village.

Texas, Dallas. Dallas Textile Mills Co.; erect mill for production of twills and drills;; initial equipment, 12,000 spindles and necessary looms; village of 70 houses; J. Perry Burrus, president.

Eagle Lake. Industrial Cotton Mills; organized with $1,000,000 capital; for manufacture of ginghams; J. A. Dromgoole, President.

El Paso. El Paso Cotton Mills Co.; about to start construction of two-story spinning mill, one-story weave shed, office building, dyehouse and cotton warehouse; 5,000 spindles and auxiliary equipment on denims, chambrays, osnaburgs and drills; A. P. Coles, president.

Houston. Houston Cotton & Twine Mills; start up first unit of plant with weekly capacity of 20,000 lbs cotton wrapping twine; construction of second unit to start immediately.

Marble Falls. Marble Falls Textile Co.; organize and take over property for establishment of 10,000 spindle cotton mill.

Canada, Woodstock, Ontario. La France Textiles, Ltd., (branch of La France Textile Co., Frankford, Pa.); capitalized at $250,000; acquire former plant of Sterling Textile Co., Ltd., and remodel for jacquard work.

NEW WOOL MILLS

California, Los Angeles. Pioneer-Pacific Worsted Co.; capitalized at $2,000,000; purchase 25 acres of land for 100-loom worsted mill and scouring, combing and spinning plant. L. J. Coburn, president.

Santa Ana. Los Angeles Textile Co.; capitalized at $1,000,000; purchased 10-acre site on Newport-Balboa Blvd.; start erec-

View of Southern Bleachery's Large New Plant at Taylors, S. C.

Connecticut, New Haven. New Haven Textile Co., 30 Washington St.; established by Sylvan H. Kohn of New Haven, for manufacture of woolen and cotton goods.

Iowa, Cedar Rapids. Hepner Rug Works; erect one-story and basement mill at Second Ave. and Eleventh St.

Maryland, Chestertown. Chestertown Worsted Mills; incorporated with capital of $50,000; plan to construct 60 x 140 foot plant; Frank R. Hansell, interested.

Massachusetts, Bedford. Bedford Spinning Co.; woolen and merino yarns; 4 sets and 2,000 spindles; C. W. Souther, treasurer.

Clinton. Clinton Woolen & Worsted Co.; start manufacture of serges in building formerly occupied by Calvin Hastings; initial equipment of five looms expected to be doubled; plan to spin yarn when alterations are completed.

Lowell. Ingham Worsted Co.; capital $150,000; Bradford system worsted yarns; 650 Lawrence St.; 2,400 spindles and complementary machinery; Mark Ingham, president.

Malden. Malden Spinning & Dyeing Co.; operate 8 cards, etc., on woolen yarn; 257 Commercial St.

Middleboro. Fraser Worsted Co.; 57 Wareham St.; capitalized at $30,000; men's wear fancy worsted; five looms; James H. Fraser, president and treasurer.

North Adams. Emil Snyder; starts manufacture of waste products for use in making wool goods in Dean-Spencer Leather Co.'s building on River St.

Northboro. Northboro Garnetting Co.; lease mill owned by Edward Sabourin and Henry Gauvin and install six new garnetting machines and other equipment; Harry Whittaker, Joseph and William Chabot, interested.

Readville. Severn Mills Co.; capital of $10,000; wool scouring plant on River St.; contemplate construction of dyehouse.

Worcester. Bancroft Woolen Yarn Co.; capital stock $15,000; subsidiary of Lombard Machine Co.; establish business in plant of Lombard Co. at 45 Heard St.

Worcester. McCurn Yarn Co.; lease former plant of Smith Mills, Inc., and install 3 sets of cards, 1 picker and 1,200 spindles on woolen yarn.

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As light as a basket but stronger and more durable for all purposes.

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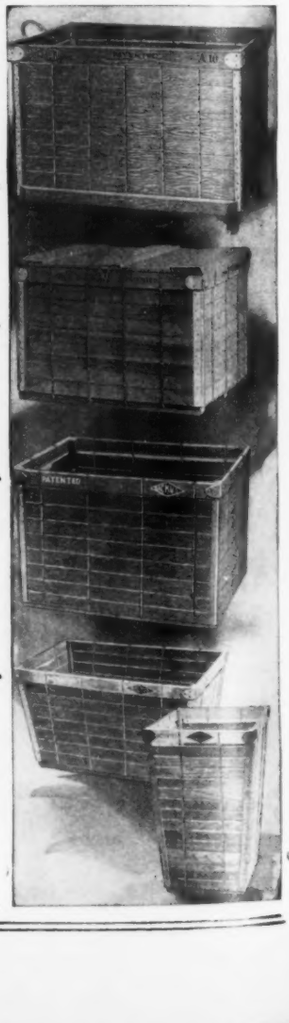


WRITE FOR CATALOGUE

A. BACKUS, JR. & SONS
Dept. T, Detroit, Mich.

Worcester. Massachusetts Felt Rug Mfg. Co.; organized by Morris Stone and Albert Epstein; operations started at 40 Cutler St.

Worcester. Nieber Mills, Inc., 41 Jackson St.; commission weaving; 12 looms.

New Jersey, Sicklerville. **Sparta Rug & Carpet Mills,** Inc.; granted charter of incorporation with capital of $125,000.

New York, Gloversville. E. L. Collins Co.; purchase building at 10 Wilson St. and equip with card, condenser, 1 picker and 672 mule spindles on woolen yarns; start early in 1924.

Rensselaer. Albany Wool Waste Mfg. Co. organize and start operations at 27 Washington St.

Seneca Falls. Seneca Rug Co., 12 Swaby St., incorporated with capital of $40,000; plan construction of new plant.

North Carolina, Gastonia. Gastonia Woolen Mills; new weave mill making clearer and cap cloth.

Pennsylvania, Chester. Disney Worsted Mills, Inc.; capital $250,000; purchase Powhattan Mills; install new machinery and start manufacture of worsted knitting yarns, Bradford system, 2-10s to 2-30s; E. R. Disney, president.

Erie. Erie Worsted Co.; purchase Erie Howitzer government plant and equip with 20 cards, 15 combs, 60 spinning frames and 200 looms; plan to double later; under direct supervision of Asa Ashworth, president of Ashworth-Odell Worsted Co., Salamanca, N. Y.

Lehighton. Lehighton Rug & Carpet Co.; start manufacture of rag carpets and fluff rugs at 650 Iron St.; 9 looms; Arthur Kemerer, president.

Primos. Morton Woolen Mills Co.; capitalized at $23,000; worsted and woolen garnetted waste; 3 garnetts and 3 pickers; Isaac Kershaw, president.

Rhode Island, Allendale. Mackie Worsted Yarn Co.; erect two-story brick mill.

Pawtucket. Halliwell Co.; award contract for three-story building for men's wear worsted mill; will operate under name of Halliwell Co., Worsted Division.

Pawtucket. Spencer Worsted Co.; start operations at 381 N. Main St.

Thornton. Carroll Worsted Mills, Inc.; organize and start production of men's wear worsteds, equipped with 24 looms; B. S. Carroll, president.

Woonsocket. Bonin Spinning Co.; incorporated with capital of $300,000; start manufacture of fine woolen and merino yarns in two-story brick plant; initial equipment, 5 sets of cards, 2 garnetts and 3 pickers; award contract for two-story addition, 106 x 52 feet; A. E. Bonin, president.

South Carolina, Greenville. Southern Worsted Corp.; erect new mill on men's wear medium grade worsted fabrics; 6,000 spindles and 120 broad looms; village of 84 houses; B. E. Geer, president.

Sumter. London Mills; started by former owners of London Woolen Mills in Enfield, Mass.; equipped with 2,400 mule spindles, 131 looms, carding, finishing machinery, etc.

Tennessee, Murfreesboro. Murfreesboro Woolen Mill; organized with $75,000 capital; erect new mill for manufacture of wool bed blankets; one story, 80 x 180 feet; one set of cards, 720 spindles and 20 broad looms; A. L. Todd, president.

Vermont, Northfield. Northfield Spinning Co.; $50,000 capital; start manufacture of woolen yarn; 1,440 spindles, 2 sets of cards and 3 pickers; Dean S. Sibley, president.

Virginia, Brucetown. Wagner Woolen Mills; start operations in former plant of Dunn Woolen Co., 9 looms; Max H. Wagner, owner.

Norfolk. Virginia Worsted Co. (controlled by Jealous & Fitch, Inc., Boston); start production of worsted yarn at 22d and Granby Sts., equipped with 3,600 spindles; **Horace Jealous, president.**

Canada, Campbellford, Ontario. Campbellford Cloth Co. (subsidiary of Toronto Carpet Mfg. Co.); take over plant of Trent Valley Woolen Mfg. Co., Ltd., for production of flannels, tweeds, overcoatings, etc.

NEW KNITTING MILLS

Alabama, Scottsboro. Scottsboro Hosiery Mill, Inc.; new brick plant, one story, 50 x 200 feet; 60 knitting machines producing mercerized and silk hosiery.

California, Oakland. Baby Shop Knitting Mills; new plant on infants' and children's goods; 3 knitting machines.

Los Angeles. Theme Hosiery Co.; start construction of first unit of plant at 2911 San Fernando Rd.; main building to be four stories, 100 x 100 feet; also three-story dyehouse, a boiler house and power house. Theodore F. Theme, president.

Colorado, Denver. Redin Hosiery Co., 1749 California St.; organized with capital of $1,000,000; plans to establish five plants in United States; one to be in Denver; John Gaffney, of Denver, president.

Connecticut, Hartford. Hartford Silk Hosiery Co.; full fashioned hose; incorporated with authorized capital of $100,000. Frederick Scarborough, president; Arthur O. Lamb, treasurer.

Hartford. Peerless Knitting Mills, 1088 Main Street; start manufacture of men's, women's and children's seamless sport hose; A. Hoffenberg, buyer.

Hartford. Petorvan Knitwear, Inc., 63 Asylum St.; incorporated with authorized capital of $50,000; goods made by contract—outside. Joseph Taretsky, president; Alfred M. Clavan, treasurer.

Hartford. United Sweater Mills; start manufacturing at 100 Village Street. I. C. Ottenberg, owner.

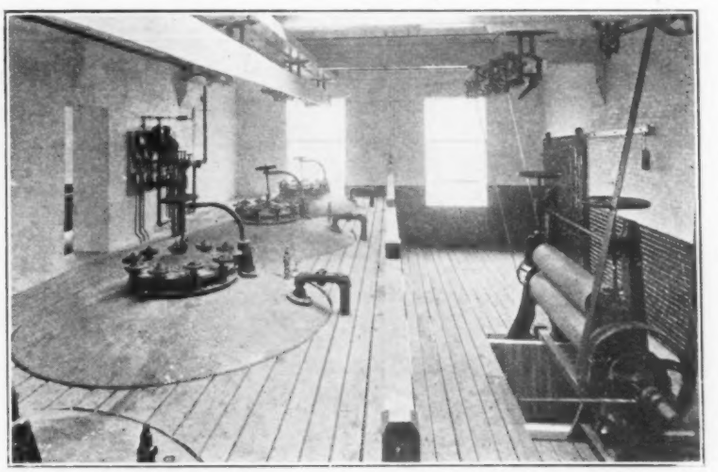
New Britain. Schroedel Knitting Co., 39 Chestnut Street; start manufacturing of bathing suits, sport coats and sweaters; operate six knitting and seven sewing machines.

New Haven. Royal Knitting Mills; new plant on neckties; 7 knitting machines and one winder; Leon Rosenberg, proprietor.

District of Columbia, Washington. F. E. Taylor, 607 Florida Avenue, N. E.; will start manufacture of hosiery.

Georgia, Carrollton. Carrollton Knitting Mill Co.; remodel building preparatory to starting manufacture of bags early in 1924. Pomp Shafer, manager.

Illinois, Chicago. Obstfeld Bros. Co.; lease three story building at 1305 Milwaukee Avenue; announce plans to remodel, and devote first floor to a retail store and upper two stories to modern sweater mill to be in operation by May.



New Kier Room at Ware Shoals (S. C.) Mfg. Co.'s Bleachery.

Kentucky, Hopkinsville. Elk Brand Shirt & Overall Co.; erect new knitting mill with capacity of 300 dozen pairs of hose per day.

Louisville. Swiss Hosiery Mill; start production at 903 S. Sixth Street equipped with 45 knitters, 15 loopers, and 2 sewing machines; also maintain department for dyeing hosiery for wholesalers and retailers; Dr. H. E. Mechling, president.

Louisiana, New Orleans. Marion-Pelican Hosiery Mills, Inc.; $10,000 capital; start manufacturing women's mercerized hose at 925 Montegut Street; George H. Booth, president.

Maryland, Baltimore. U. S. Knitting & Textile Mills; sweater coats and bathing suits; 18 knitters, 18 ribbers, 10 sewing machines.

Hagerstown. Shalwin Hosiery Mills; start manufacture of silk and mercerized seamless half hose, equipped with 26 knitting machines, four ribbers, three loopers, dyeing and finishing machinery. Charles W. Cromer, proprietor.

Massachusetts, Boston. Sherer Knitting Mills; bathing suits and sport wear; 118 Roxbury Street; 4 circular latch needle knitting machines and 8 sewing machines; plan to increase; A. J. and Louis Sherer, owners.

Boston. Winthrop Hosiery Mills; start manufacturing at 116 Bedford Street; Jacob L. Berger, prop.

Canton. Esten-Johnson Co.; capitalized at $20,000; start manufacture of infants' and childrens' knit underwear in three-story mill; D. F. Johnson, president; P. A. Esten, treasurer.

Needham. Hillside Knitting Co.; established plant at 232 Hillside Avenue; 2 knitters, 1 looper.

New Bedford. Ashley Knitting Co.; 81 N. Water Street; start production of women's hosiery; 9 knitting machines, one sewing machine and one looper; Kenneth V. Ashley, general manager.

Worcester. Holden Knitting Co.; incorporated with capital of $25,000; secure space in Lowell Bldg., 9 Norwich Street, and equip with machinery. Charles S. Holden, president.

Missouri, Carthage. Carthage Hosiery Mills; incorporated with capital of $50,000; plan to establish plant with daily output of 200 dozen pairs of hose; Paul F. Vogel, Belleville, Ill., president.

New Jersey, Jersey City. Duraknit Hosiery Mills, P. O. Box 115, Bergen Station; start manufacture of silk hosiery, equipped with three spring needle knitting machines, one seamer and one looper; S. Lulejian, prop.

Jersey City. Hudson County Knitting Mills; 421 Wayne Street; organize and start operation of plant. Anthony Sieno, prop.

West Hoboken. Vargish & Schmidt Knitting Mills; 613 Savage Street; start production of infants' and childrens' knit goods; 150 cotton spindles, four knitting machines and six sewing machines.

West New York. West New York Knitting Mills; 322 Tenth Street; capital $30,000; silk and fibre silk scarfs, veils, and knitted fabrics; 8 knitting machines and one winder; Jules Donadt, president.

New York, Bath. Earl L. Green Knitting Mills; organized with capital of $25,000; start construction of one-story brick plant on South Avenue, 50x100 feet.

Brooklyn. Avanel Knitwear Co.; start manufacture of sweaters, knitted suits and novelties at 129 Patchen Avenue; Averia & Luepp, New York, selling agents.

Brooklyn. Malda Knitwear Mills, 1486 Gates Avenue; incorporated with capital of $10,000 for manufacture of ladies' novelty sweaters; Myer Malakoff, president.

Brooklyn. Peter Pan Knitting Mills, Inc., 435 Hart St.; capital $12,000; start manufacture of 140,300 denier artifical silk knitted fabrics; 84 spindles and 6 knitting machines; Sam Siegell, president.

Brooklyn. Whitehall Knitting Mills; incorporated with capital of $10,000; Harry and Annie Becker, 92 Hopkins Street, interested.

Gloversville. William G. Hartin; open plant for manufacture of children's specialty mittens at 54 Spring Street.

Johnstown. C. Dillenbeck & Sons; lease space in former plant of Royal Knitting Mill Co. and start manufacture of knit glove linings early in 1924.

New York. Elaine Knitting Mills, Inc.; established at 93 Prince Street; manufacture infants' and children's knitted specialties; H. Silverman, president.

New York. Gee & Em Knitting Mills; organized by W. Gordon and L. Magnin for manufacture of sweaters and bathing suits at 115 Suffolk Street.

New York. Levi & Rottenberg, Inc.; manufacture knitted fabrics 37 W. 26th st.

New York. Lloyd Knitting Mills; incorporated with capital of $10,000 to manufacture silk and artificial silk knitted fabrics; incorporators, Roman Lowenberg, Hannah Lowenberg and L. I. Itzkowitz.

New York. Pals Knitwear Co., 34 E. Tenth Street; incorporated with capital of $10,000; manufacture ladies' mohair and fibre silk sweaters and dresses; six flat knitting machines.

New York. Seville Knitting Mills; capitalized at $200,000; start manufacture of knitted piece goods and knitted neckwear at 568 Broadway.

New York. Sandel Knitting Mills; start production of knitted novelty sweaters, suits and dresses at 254 E. Burnside Ave.

Rome. Allison & Green Co.; incorporated with capital of $20,000 to manufacture knit underwear; William E. Allison, interested.

North Carolina, Burlington. Mohawk Hosiery Mills; $100,000 capital; start manufacturing equipped with 38 knitting machines and 8 loopers.

Charlotte. Nebel Knitting Co., Kingston Avenue; $200,000 capital; start manufacture of full fashioned silk hosiery; 8 knitting machines, 3 loopers and 3 sewing machines; Wm. Nebel, president.

Murphy. Oak Lane Knitting Mills, Inc.; erect mill for manufacture of women's and children's cotton and worsted ribbed underwear; 70 latch needle knitting machines; 65 sewing machines; dye and finish; A. C. Richmond, president.

Reidsville. Cartex Underwear Co.; $500,000 capital; erect mill for manufacture of men's knit union suits; 22 knitting and 40 sewing machines; Wm. H. Carter, president; W. L. Pannill, treasurer and superintendent.

Winston-Salem. Dryad Mills Co.; start manufacture of women's vests, pants and union suits.

Ohio, Cleveland. Cuyahoga Knitting Mills Co.; $25,000 capital; start manufacture of sweaters in new mill at 500 W. St. Clair Ave.; 30 knitting and 18 sewing machines; Walter Maxwell, president.

Oregon, Bend. Bend Woolen Mills; start production of underwear, sweaters and sweater coats in one-story brick building, 40x60 feet; 14 knitting and 18 sewing machines; plan to enlarge; John Steidl, treasurer.

Pennsylvania, Gordon. Gordon Knitting Mills; start manufacture of men's and women's jumbos, vests, and women's union suits at Biddle St.; 8 knitting and 12 sewing machines; Charles Heine, president.

Hazleton. Baker Underwear Co.; start manufacture of men's and boy's cotton underwear; H. J. Baker, prop.

Philadelphia. Dainty Foot Hosiery Co.; organized with $25,000 capital and start manufacturing at Margaret and Dittman Sts., Frankford; 3 full-fashioned knitting machines, 1 looper and 2 sewing machines; Thos. H. Moore, president.

Philadelphia. K-C Hosiery Mills; $10,000 capital; start production of men's seamless hosiery at Erie Ave. and Amber St.; J. Kugelman, president.

Philadelphia. Logan Hosiery Co.; start manufacture of full fashioned hosiery at 3213 Frankford Ave., equipped with 20 machines; Fritz Vitel, superintendent.

Philadelphia. New Style Knitting Mills; organized by Samuel Menograd; start manufacture of men's and women's novelty sweaters at 439 Leonard St.; 11 flat machines.

Philadelphia. Record Hosiery Mills, Inc.; $50,000 capital; start manufacture of full fashioned hosiery at N. W. Cor. G and Venango Sts.; Harry Cooper, president.

Philadelphia. Red Mill Hosiery Co., Inc.; start manufacturing at 3936 Frankford Ave.; Morton Harvey, president.

Philadelphia. Star Knitting Mills; install machinery for manufacture of high-grade knitted silk neckwear in building at Hancock and Oxford Sts.

Philadelphia. Triumph Hosiery Mills, Inc.; $50,000 capital; start manufacture of women's silk hosiery at S. W. Cor. 3rd and Cumberland Sts.; 60 knitting machines, 4 loopers and 4 sewing machines; A. H. Goodman, president.

Weissport. Vertex Hosiery Mills, Inc.; capitalized at $100,000; start manufacture of full fashioned silk hosiery on Railroad St.; operate 10 knitting machines, 3 loopers and 3 sewing machines; Wm. F. Hofford, president.

Wilkes Barre. Cantor Knitting Mills; start production of men's and women's bathing suits at 285 S. Main St., equipped with 17 knitting and 10 finishing machines; A. Cantor, prop.

Williamstown. D. M. S. Hosiery Mills Co.; start manufacture of men's seamless half hose; Wm. J. Durbin, treasurer.

York. Cordorus Hosiery Co.; capitalized at $25,000; start production of men's cotton half hose in new plant at College Ave. and Newberry St.; two-story, brick 140x40 ft.; also boiler house and dyehouse, 40x60 ft.; 109 knitting machines, 20 ribbers, 6 sewing machines; L. A. Allwine, president.

South Carolina, Landrum. Appalache Hosiery Mills; organized and arranged to start manufacture of cotton hosiery.

Tennessee, Chattanooga. Nicholson Hosiery Mills; capital $50,000; erect new plant at 817 1-2 Cherry St. for manufacture of women's 260-needle silk hosiery; later merged with Dalton (Ga.) Hosiery Mills.

Knoxville. Southern Textile Mills; incorporated with $50,000 capital; start manufacture of knitted ties and ladies' silk sweaters at 1204 Munson Ave.; Victor Sprulli, president.

Telford. Telford Knitting Co.; erect two-story brick and concrete mill and equip with spring needle machines for manufacture of ladies' silk hose; Guy Maloney, president.

Wisconsin, Menesha. Nicolet Knitting Co.; start manufacture of men's, boys' and juvenile shaker coats and pullovers; 5 knitting and 5 sewing machines; later increase equipment; Ray W. Keefe, president.

Canada, Lindsay, Ontario. James Horn Knitting Co., Ltd.; capitalized at $50,000; start manufacture of silk, cashmere and worsted hosiery; equipped with 12 knitting machines and 3 loopers; James S. Horn, president.

Port Dover, Ontario. Elton Knitting Mills, Ltd.; $600,000 capital; take over plant of Penman's, Ltd. and start production of high grade underwear for women and children, and jersey cloth; initial equipment of four sets of woolen cards, 4 pickers, 5 sets of mules, 24 knitting machines, 2 ribbers and 39 sewing machines; A. E. Elton, president.

NEW SILK MILLS

California, Hermosa Beach. Golden State Silk Mills, Inc.; start construction of first unit of plant to house 6,000 spindles and 200 looms. E. J. Young, president.

San Francisco. Perfection Silk Mills; capitalized at $50,000; start operations in one-story concrete building at 921 Harrison St.; branch at 969 E. 31st St., Los Angeles; Edward Chisdini, president.

Walnut Creek. Pacific Cellulose Co., Inc.; purchase plant of Diablo Glove Works; remodel and erect new buildings; employ 80 operatives in manufacture of artificial silk; E. L. Bell, president.

Connecticut, Middletown. Middletown Silk Co.; organized by Max, Harry, Emanuel and Joseph M. Bornstein of Paterson, N. J.; temporary plant on Hubbard St.; start construction of new mill on N. Main St., to be two stories, 60x230 ft.; 108 box looms.

Rocky Hill. Belamose Corp.; purchase 187-acre tract of land, factory and houses

from Hartford Electric Steel Co.; erect five brick and reinforced concrete buildings, 140x580 ft., 140x510 ft., 140x70 ft., 30x60 ft., and 30x70 ft.

Maryland, Baltimore. James P. Hooper Mfg. Co.; capitalized at $375,000, installing machinery for manufacture of artificial silk under a special process developed by James P. Hooper, president.

Massachusetts, Canton. Founders' Silk Co.; purchase and remodel plant; Gilbert E. Kemp, Arlington, Mass. and J. Sheldon Cartwright, Winthrop, Mass., interested.

Fall River. Mohican Weaving Co.; 40 looms on silks and cotton backed satin; capital, $100,000.

Lowell. Lowell Silk Mills (controlled by Newmarket Mfg. Co.); start operations in former No. 2 mill of Bigelow-Hartford Carpet Co.; Walter Gallant, manager; 1,700 spindles and looms on broad silks.

New Jersey. Belmar. Seacoast Yarn Co.; capitalized at $100,000; artificial silk throwsters and dealers in 150 and 300 denier silk twist, floss, etc.; six 5-B spinners, 25 winders, 6 reelmills, 12 doublers, and dyeing plant; Harry Lasky, president.

Maple Shade. Pendlesauken Silk Mill; construct two-story, 66x127 ft., concrete and brick mill on Stiles Ave.; will install 18 2x1 box looms, 26 4x4 box looms, and 26 Jacquards for manufacture of broad silks; Donald G. Mackay, president.

Paterson. Horwitz & Long; established plant at 79 Godwin St. for manufacture of broad silks.

Paterson. Rose Weaving Co.; 24 Van Houten St.; start operation of new plant on broad silks; Nathan M. Platt, manager.

Paterson. Superior Artificial Silk Throwing Co.; capital $3,000; headed by William and John A. Derbyshire, 221 Martin Street.

West Hoboken. Z. B. Yarn Mills; organize and start operations at 507 Malone St., throwing, winding and coning artificial silk; Andrew, Joseph, and Henry Zenorini partners.

West New York. Domestic Knitting Mills, Inc., 418 Tenth St.; organized with capital of $125,000; to manufacture fancy artificial silk knitted fabrics; Otto Kohler, president and treasurer.

New York, Binghamton. Kohn & Courter Co.; start production of silks at 43 Collier St.

Gloversville. M. C. Dennie (former owner of Dennie Silk Mills); erects new mill at 30 E. 11th Ave.; brick, two-story, 100x150 ft.; 10 looms, 6 double winders, 4 warping machines, dyeing equipment, etc.

New York. Lustreyarn Ribbon Co., Inc.; $10,000 paid up capital; artificial silk ribbons, millinery trimmings, tinsel threads, etc.; 40 W. 25th St.; Leo F. Stein, president.

Pennsylvania, Allentown. Penn State Silk Mills, Inc.; organize and arrange to operate two plants on production of skein dyed silks; **D. J. Dery, interested.**

Bally. Thomas H. Kinney; starts manufacture of silk ribbon for hat bands.

Emaus. Tremont Silk Mills, Inc.; $20,000 capital; start manufacture of broad silks at 6th and North Sts.; John Widder, president.

Sellersville. Lyons Artificial Silk Co.; establish new mill.

Tennessee, Nashville. Du Pont Fibre Silk Co. (Buffalo, N. Y.); purchase about 502 acres of land, former site of Old Hickory Powder Plant, and plan erection of $4,000,000 plant for manufacture of artificial silk.

Canada, Cornwall, Ontario. Courtauld's, Ltd. of London, England; purchase 240 acres of land and plan early construction of plant to manufacture artificial silk.

St. Catharines, Ontario. Grout & Co., Ltd. of Great Yarmouth, England; acquire plant here and install machinery for manufacture of silk piece goods.

NEW MISCELLANEOUS MILLS

California, Orange. Western Cordage Co.; start manufacture of manila rope and cordage in new plant consisting of two buildings, 96x136 ft. and 30x100 ft.; 30 spindles. O. B. Geller, president.

Redlands. Southwest Textile Finishing Co., Harley E. Smith; dye and bleach cotton and art silk yarn.

Connecticut, Shelton. Metallic Process Corp.; organized with paid-in capital of $50,000 to manufacture metallic cloth. G. H. Eiswald, Woodcliffe Lake, N. J., president; F. D. Chency, vice-president.

Iowa, Osage. Mity Fibre Products Co.; organized and start manufacturing of hemp; W. G. Mee, Box 155, in charge.

Maryland, Aberdeen. Maryland Finishing Co.; capitalized at $150,000; erect new concrete plant and start operations; F. Tevis Baker, president.

Massachusetts, Lawrence. Mulvey Yarn & Dyeing Co.; dyers of wool and cotton yarn; 3,000 lbs. weekly.

Worcester. Worcester Spinning Corp.; incorporated with capital of $2,500,000; lease plant on Beacon St. and equip for manufacture of rhea yarn; will start operations early in 1924; Roscoe S. Milliken, president.

New Jersey, Clifton. Cretona Print Works Inc.; chartered to print and dye fabrics.

Paterson. Textile Novelty Dyeing Co.; $100,000 capital; start operation of new plant at 80 George St., employing 25 hands; Edward Weiss, president.

New York, Johnstown. Bertram Goldberg, Inc.; capitalized at $75,000; purchase plant of B. & B. Fabric Corp. on W. Clinton St.; install equipment for dyeing, bleaching and finishing.

New York. David Welsh; start textile finishing plant at 620 W. 44th St.; equipped to do shearing, brushing, tentering, calendering measuring, finishing, winding and rolling.

North Carolina, Oxford. M. & C. Hosiery Mills (formerly of Burlington) start new plant here, specializing in mending and dyeing or converting seconds and thirds, all grades.

Pennsylvania, Philadelphia. Dupont Dye Works; start operations at Dupont and Fechin Sts., Boxborough; dye and finish tops; daily capacity 2,500 and 3,000 pounds; Wm. W. Brook, proprietor.

Philadelphia. Sterling Dye Works; A. W. Johnson, prop.; start dyeing, bleaching, mercerizing and coning of yarns at 2824 Jasper St.

Philadelphia. Sylvania Dyeing Co.; start dyeing and bleaching of silk hosiery at 4351 Elizabeth St.; capacity 4,000 pounds daily; Wm. H. Janney, president.

South Carolina, Graniteville. Gregg Dyeing Co. officers and stockholders same as Graniteville Mfg. Co.; erect reinforced concrete dyehouse and finishing plant; plan to start operations about Mar. 1, 1924.

Greenville. Southern Bleachery, Inc.; build plant at Taylors for ultimate capacity of 3,000,000 yards per week; bleaching and finishing building E-shaped, 718 ft. long and 314 ft. wide; finishing end two stories and basement, 314x106 ft.; warehouse and power plant; motor drives throughout; village for operatives.

Canada, Iroquois, Ontario. Caldwell Linen Mills, Ltd.; erect plant for manufacture of towels, tablecloths, napkins, etc.; main building 148x40 ft.; boiler house 20x20 ft.; Robert C. Caldwell, president.

St. Johns, Quebec. Franco-Canadian Dyers, Ltd.; capital $350,000; dyeing and finishing woolen piece goods; Jules Demetre, president.

Toronto, Ontario. Barrymore Cloth Co., Ltd.; erect two-story concrete building, 290x100 ft.; equip as dyehouse and finishing plant.

Toronto, Ontario. Summit Dyeing Co., Ltd. (branch of Summit Dyeing Co., Inc. of North Bergen, N. J.); purchase plant, remodel and equip with new machinery, accompanying looms for production of denims.

Cedartown. Cedartown Cotton & Export Co.; install 12,000 ring spindles in Mill No. 2 and 4,000 twister spindles in Mill No. 1.

Columbus. Swift Mfg. Co.; install 50 looms and 50 34-in. automatic looms; also additions and changes in picker room, including installation of new machinery.

Crawford. Crawford Cotton Mills; install 98 36-in. Nordray looms for production of canton flannel.

Dalton. Crown Cotton Mills; build one-story reinforced concrete addition to plant.

Griffin. Kincaid Mfg. Co.; erect three-story, 107x180-ft. weaving and cloth room addition.

Habersham. Habersham Mills; erect 5,000 spindle addition and plan greater expansion.

Hawkinsville. Henry Cotton Mills; build 40-ft addition and install spindles and looms for manufacture of ratine.

La Grange. Dunson Mills; add 56 looms to main mill building; erect 50x200-ft. cloth warehouse and a 100x300-ft. structure for special processes, bringing total equipment to 40,000 ring spindles, 15,000 twister spindles, 1,000 looms, accompanying cards and other machinery for consuming annually about 25,000 bales of cotton; also build 60 five-room cottages for operatives.

Macon. Bibb Mfg. Co.; extensive improvements in Macon and Porterdale villages, including about 20 miles of concrete sidewalks, storm drainage system, etc.; purchase about 75 acres of land for future extension of village.

Monroe. Walton Cotton Mill; erect 50-ft. addition to mill, a weave shed and cloth room addition, an opener building and a warehouse to double present storage space; 5,712 new spindles and 150 looms installed; erect about 30 cottages for operatives.

Sargent. Arnall Mills; add about 5,000 spindles; auxiliary carding and drawing machinery.

Tennille. Washington Mfg. Co.; purchase Tennille Yarn Mills and install 100 looms, warping, beaming, quilling, spooling and cloth room machinery; change output from yarns to medium and heavy duck.

Thomaston. Peerless Mills; install 10,000 new spindles; erect 100 cottages for operatives.

Thomaston. Thomaston Cotton Mills; install additional machinery for manufacture of tire fabrics; plan erection of bleachery to cost about $500,000.

West Point. West Point Mfg. Co. and Lanett Cotton Mills merged under name of West Point Mfg. Co.; capitalized at $7,000,000; continue operation of plants in West Point, Ga., Fairfax, Langdale and Shawmut, Ala.; erect $100,000 school house and make extensive improvements in mill villages.

Illinois, Chicago. Western Shade Cloth Co.; erect four-story mill, 85 x 290 feet, at 3023-51 S. Jefferson St., costing about $450,000; also new power house.

Kentucky, Louisville. Louisville Textile Co.; erect new mill at Thirty-ninth and Magazine Streets, one-story, 100 x 150 feet; install additional looms.

Maine, Lewiston. Bates Mfg. Co.; complete extensive alterations started last year.

Lewiston. Hill Mfg. Co.; erect new seven-story addition to Mill No. 2 and additional four stories, 72 x 120 feet, on top of Mill No. 4; increase capital from $1,000,000 to $1,500,000; add new spindles.

Waterville. Lockwood Co.; install 460 new looms with individual electric motors to replace old looms.

Winthrop. Winthrop Mills Co.; addition to warehouse, brick, 35 x 100 feet, three stories.

Maryland, Baltimore. Lapsey & Bros. Co.; acquire portion of former plant of Mount Vernon-Woodberry Mills Co., totalling about 40,000 sq. feet of space; remodel and equip for manufacture of shade cloth.

Baltimore. W. & J. Knox Net & Twine Co.; two and four-story mill addition 80 x 112 feet, costing about $65,000.

Massachusetts, Adams. Berkshire Cotton Mfg. Co.; erect one-story, 50 x 100 foot mill addition.

Boston. American Cotton Fabric Corp., authorized capital $7,500,000, business formerly conducted by Passaic Cotton Mills at Fall River, Mass.; New Bedford, Mass. and Passaic, N. J.

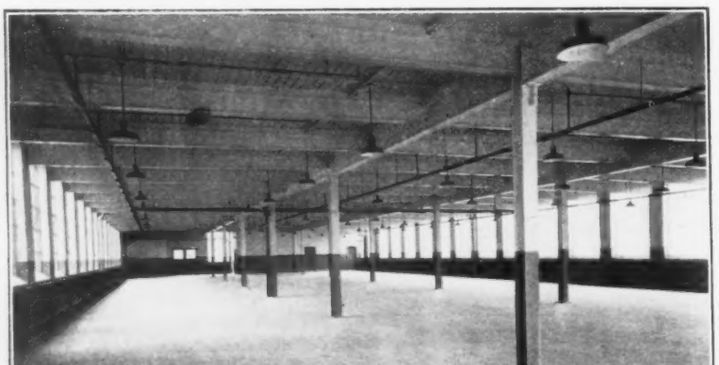
Boston. New England Southern Mills, formed by consolidation of International Cotton Mills and plants recently purchased by Lockwood, Greene & Co. in South; plants in merger are: Pelzer (S. C.) Mfg. Co., Tucapau (S. C.) Mill's Stark Mills, Hogansville, Ga.; Hogansville (Ga.) Div. of International Grange (Ga.) Div. of International Lisbon (Me.) Div. of International Lowell (Mass.) Div. of International Cosmos Cotton Co., Ltd., Yarmouth, N. S. and Imperial Cotton Co., Ltd., Hamilton Ont., Canada.

Fall River. Stevens Mfg. Co.; erect brick storehouse, 88 x 70 feet.

Fall River. Union Cotton Mfg. Co.; erect one-story, 107 x 50 foot picker house; also one-story 300 x 26 foot addition to weave shed.

Housatonic. Monument Mills; construct new dyehouse of concrete, brick and steel, three stories, 235 x 49 feet.

Lowell. Lowell Division of New England Southern Mills; **transfer tire** fabric machinery to new Stark Mills in Hogansville, Ga. and install approximately 700 looms for manufacture of wide sheetings here.



Interior of Fourth Story of New Building No. 16 of Jamestown Worsted Co., to be Used for Drawing and Roving Processes.

Enlargements and Improvements

COTTON

Alabama, Alexander City. Alexander City Cotton Mills; erect 350-ft. spinning addition and 196-ft. weave shed addition; 22,000 spindles; also 50 cottages for operatives.

Alexander City. Russell Mfg. Co.; add 456 spindles in each of their mills, the Bettie Francis Cotton Mills, the Roberta Mills and the Russeo Mills; erect additional unit to be known as Mill No. 5, containing 2,448 spindles; also erect school building.

Anniston. Anniston Yarn Mill's add 6,000 spindles.

Athens. Wellman Cotton Mills Co., Inc.; install new machinery costing approximately $100,000; erect ten cottages in mill village.

Huntsville. Huntsville Knitting Co.; sell knitting and knit goods finishing equipment and install 200 narrow looms for manufacture of chambrays; continue operation of carding and spinning departments.

Huntsville. Lincoln Mills of Alabama; start erection of 124x600-ft. addition; also enlarge mill village.

Huntsville. Lowe Mfg. Co.; erect three warehouses and 20 cottages; add 50 looms.

Huntsville. Merrimack Mfg. Co.; complete erection of cloth room, 100x100 ft., and cotton warehouse, 75x100 ft.; install new sewer system and erect 70 houses in mill village; add 70 looms.

Opelika. Opelika Mfg. Co. (formerly Opelika Cotton Mills); extensive improvements including installation of additional machinery to increase capacity; new dyehouse erected.

Selma. California Consolidated Cotton Co.; incorporated with authorized capital of $750,000 to take over Sunset Textile Mills, Selma Mfg. Co. and Alabama Mills in Selma, and the Canebrake Mills in Uniontown, Ala.; ordered 3,000 additional spindles for Alabama Mills.

Sycamore. Sycamore Mills; replace old spinning frames with new ones and add 10,000 spindles; improve mill village and construct school.

Union Springs. Union Springs Cotton Mills; purchased by Donald Comer of Birmingham; being equipped with new machinery throughout for manufacture of single warp yarns; erect 25 houses for operatives and two warehouses; production to start next spring.

Arkansas, Helena. Delta Land Co. (subsidiary of Parkhill Mfg. Co., Fitchburg, Mass.); installed 5,000 additional spindles.

California, Los Angeles. Imperial Cotton Mills plan to double capacity.

Oakland. California Cotton Mills Co.; rebuild section of plant destroyed by fire; construct new one-story warehouse.

Orange. California Cordage Co.; completed and started operation of 2,080 ring spindle mill.

Connecticut, Bridgeport. Raybestos Co.; erect 26x54-ft. concrete and steel boiler house.

Middletown. Frissell Fabric Co.; erect one and one-half story addition 88x100 ft., brick and sawtooth roof; increase capital stock from $100,000 to $200,000.

New Haven. American Velvet Co. purchased Wimpheimer silk mill for approximately $360,000; operate plant in conjunction with others.

Oakdale. Massasoit Mfg. Co.; erect two one-story additions, 40x65 ft. and 40x40 ft.

Putnam. Adams Mfg. Co.; erect new weave shed, two stories, 110x105 ft.; additional story, 60x45 ft., to plant purchased from Nightingale-Morse Mills, Inc. and otherwise improve property.

Rockville. Bonita Lace Co., organized to operate plant formerly the Stafford Lace Co.; capitalization reduced from $600,000 to $300,000.

Versailles. Hygienic Fibre Co., Inc.; purchase Versailles Sanitary Fibre Mills, Inc.; enlarge plant; Spencer Borden, Jr., president.

Georgia, Acworth. Acworth Cotton Mills, take over Acworth Mfg. Co. and erect addition costing about $125,000.

Athens. Bowen-Crews Co. buys Sunlight Mill No. 1; 5,000 spindles.

Athens. Mallison Braided Cord Co.; rebuild plant destroyed by fire and resume manufacturing; equipped with 2,100 ring spindles, 500 twisting spindles, 12 narrow looms and 150 braiders.

Atlanta. Couch Cotton Mills in Thomson, Ga., East Point, Ga., and Greenville, S. C. sold to Lullwater Mfg. Co.; Thomson and East Point plants will weave chambray, the latter plant being supplied with yarn from the Greenville plant; equipment being modernized and reorganized; Walter T. Candler, Atlanta, president.

Atlanta. Exposition Cotton Mill's, install 100 40-in. and 250 60-in. looms.

Atlanta. Fulton Bag & Cotton Mill's; complete erection of power plant; install 3,500 k. w. extraction type, steam turbo-generator and switchboard.

Barnesville. Aldora Mills; expend about $30,000 for improving plant constructing 12 new cottages for operatives, etc.

Berryton. Berryton Mills; install about 3,500 new spindles and auxiliary equipment; also erect additional houses for operatives.

Canton. Canton Cotton Mills; erect addition to house 25,000 spindles and

Malden. Multiple Winding Co.; erect two-story, brick addition.

New Bedford. Acushnet Mill Corp.; erect addition, to be used as drawing room, to present picker house; one-story high, 60 x 100 feet, brick.

New Bedford. Butler Mill; takes over Nemasket Mills of Taunton, Mass. and operate under name of Butler Mill Nemasket Division.

New Bedford. Sharp Mfg. Co.; install 1,000 Draper, 44-inch automatic dobby looms on top floor of Mill No. 2.

New Bedford. Whitman Mills; construct brick addition to plant, costing about $50,000.

Salem. Naumkeag Steam Cotton Co.; erect additions to weave shed and cloth room.

Michigan, Detroit. Dean & Sherk Corp.; erect new dyehouse; close Palmer (Mass.) branch and move machinery to Detroit.

Mississippi, Jackson. Cotton Mills Products Co.; increase capital from $750,000 to $1,000,000; motorize engine-driven mill and install new lighting system.

Stonewall. Stonewall Cotton Mills; install 132 new automatic looms.

Yazoo City. Yazoo Yarn Mill; enlarge plant and install 228 looms on 36-inch sateen.

Missouri, Cape Girardeau. American Gauze & Cotton Co., St. Louis; construct plant for manufacture of absorbent cotton and specialties.

New York, Buffalo. Buffalo Weaving & Belting Co.; file plans for addition, 12 x 23 feet.

Palmyra. Garlock Packing Co.; construct new two-story warehouse; 200 x 100 feet; providing for addition of two more upper floors at later date.

Utica. Utica Steam & Mohawk Valley Cotton Mills; erect 63 x 123 foot addition to plant; also 80 x 160 foot warehouse.

North Carolina, Asheville. Asheville Cotton Mills; install 10,000 new spindles; 8,000 of these to replace old machinery.

Avondale. Haynes Mills; build new finishing room, 175 x 75 feet.

Bessemer City. American Cotton Mills; build two-story brick addition to house approximately 5,000 spindles and 50 broad looms.

Bladenboro. Bladenboro Cotton Mills, Inc.; erect Mill No. 3; 15,000 spindles.

Cedar Falls. Sapona Cotton Mills; install 3,850 additional ring spindles.

Central Falls. Pennsylvania Yarn Mills, Inc.; capital $300,000; take over and enlarge plant of Central Falls Mills, Inc.

Charlotte. Highland Park Mfg. Co.; erect one-story, 75 x 98-foot mill addition.

Charlotte. Carl Stohn, Inc., Hyde Park, Mass.; lease floor in Wade Loft Bldg., for branch plant.

Concord. Brown Mfg. Co.; erect 75-foot, two-story dyehouse.

Concord. Cannon Mfg. Co.; erect new slasher room addition.

Concord. Gibson Mfg. Co.; erect new finishing plant and enlarge steam plant.

Concord. Norcott Mill Co.; erect three-story brick addition, 80 x 104 feet; 6,244 twister spindles with accompanying spoolers, ball warpers, combers, etc.

Clayton. Liberty Cotton Mills Co.; erect 104 x 135 foot addition and equip with 5,000 spindles.

Cramerton. Mayflower Mills, the new weaving unit of Cramerton Mills, Inc., completed and 500 looms installed for manufacture of silk and cotton goods; ultimate plans are for 5,000 looms; include dye plant; enlarge mill village.

Duke. Erwin Cotton Mills Co.; erect Mill No. 5; two-story reinforced concrete spinning mill for 35,000 spindles, one-story daylight construction weave shed for 1,152 looms, also modern village; manufacture indigo blue denims.

Fayetteville. Victory Mfg. Co.; add 100 automatic looms.

Forest City. Alexander Mfg. Co.; erect one and two-story weave shed for manufacture of wide sheetings; ultimate capacity 350 looms.

Gastonia. Dixon Mills, Inc.; add 4,000 new spindles.

Gastonia. Groves Mills, Inc.; start operations in Mill No. 2, a two-story brick and steel structure having 15,000 spindles.

Gastonia. Loray Division of Manville-Jenckes Co.; build three-story addition to new two-story building, making room for 25,000 additional spindles; also erect new weave shed to house 125 looms.

Gastonia. Myrtle Mills, Inc.; build additional mill and install 5,000 spindles with accompanying machinery for spinning wider range of cotton yarn in double carded peeler quality.

Henderson. Harriet Cotton Mills; extension to Mill No. 3; two-story, 100 x 104 feet, and install 4,000 twister spindles, spoolers, winders and ball warpers.

High Point. Highland Cotton Mills, Inc.; purchase Cloverdale Cotton Mills and operate as Mill No. 3.

High Shoals. High Shoals Cotton Mills; sold to Manville-Jenckes Co., Pawtucket, R. I. who plan to enlarge plant.

Hillsboro. Belle-Vue Mfg. Co.; enlarge mill adding approximately 5,000 spindles and 200 looms; extend dyehouse; erect two-story slasher cloth finishing and storage building.

Hillsboro. Eno Cotton Mills; erect two-story brick addition for new spindles and looms; also build new homes for operatives.

Kannapolis. Cabarrus Cotton Mills; install approximately 15,000 new spindles.

Kings Mountain. Dilling Cotton Mills; build two-story addition, 56 x 80 feet, for additional picking and carding machinery.

Lenoir. Nelson Cotton Mill Co.; construct plant for manufacture of carded peeler yarn, 24s to 30s; 6,000 spindles; planned last year.

Lexington. Erlanger Cotton Mills; erect additions to cloth storage and opener room buildings.

Lincolnton. Anderson Mills, Inc.; install 6,000 additional spindles with accompanying machinery.

Lowell. Art Cloth Mills, Inc., Gastonia; erect new plant in Lowell; one-story reinforced concrete, 592 x 192 feet; 600 looms.

Lumberton. Mansfield Mills (merger of Lumberton and Dresden Cotton Mills); capital $1,000,000; erect new mill and install 40,000 ring spindles and 600 looms for production of sateens and 2-ply yarns, carded and combed.

Maiden. James Cotton Mills, Inc.; take over and operate Maiden Cotton Mills Nos. 1 and 2.

Monroe. Bearskin Cotton Mills, Inc.; install 2,500 new twister spindles; also spoolers and warpers.

Monroe. Monroe-Manetta Cotton Mills; take over Standard Cotton Mills and resume manufacture of wide sheetings; H. B. Heath, president.

Mooresville. Cascade Mills, Inc.; take over Dixie Cotton Mill, extend and revamp; 12,000 ring spindles and 300 looms; will start manufacturing fine shirtings, silk and cotton novelties about March 1, 1924.

Extension to Yarn Mill of Bigelow-Hartford Co. at Thompsonville, Conn.

Mooresville. Mooresville Cotton Mills; erect 600 x 136 foot mill addition, two warehouses and about 100 houses for operatives.

Norwood. Norwood Mfg. Co.; build extensions for 5,000 additional spindles with accompanying carding machinery.

Raleigh. Caraleigh Mills; build one-story and basement cloth storage building.

Rhodhiss. Rhodhiss Mills Co.; install 300 automatic looms and new warp-tying machine in Mill No. 2.

Roanoke Rapids. Roanoke Mills Co.; install 42 looms, 8 spinning frames, 2 intermediate frames, 8 cards and 2 breakers in Mill No. 2; also erect cloth storage warehouse, three stories and basement.

Roanoke Rapids. Rosemary Mfg. Co.; install 3,024 spindles, 12 cards and 2 roving frames in unoccupied space.

Rockingham. Entwistle Mfg. Co.; build Mill No. 2 and equip with 22,000 spindles and 500 looms.

Rockingham. Hannah Pickett Mills; award contract for 300 x 250 foot addition to house 25,000 spindles and 800 looms.

Rockingham. Pee Dee Mfg. Co.; erect additions to house 9,000 new spindles and 600 looms.

Rockingham. Steele's Mills; erect one-story addition 75 x 100 feet, for slashing and beaming; build complete new power plant; four new warehouses and new opener and waste working rooms; install two new water wheels and electrify entire mill.

Rocky Mount. Rocky Mount Mills; erect 80 x 80 foot addition to house 5,000 spindles.

Roxboro. A. T. Baker & Co., Inc.; Manayunk, Phila., Pa.; erect one-story daylight construction mill, 192 x 96 feet for manufacture of cotton pile fabrics; 30 looms; also mill village of 15 houses.

Spindale, Horn Co.; erect new two-story plant.

Spindale. Spindale Mills Co.; install 4,968 spindles in addition started last year.

Spindale. Stonecutter Mills Co.; build 175 x 400 foot addition to house 504 looms.

Statesville. Statesville Cotton Mills; install additional carding, drawing and other machinery; improve operatives' houses, streets and grounds.

Stony Point. Watts Spinning Co.; add 4,000 ring and 2,000 twister spindles to initial equipment.

Thomasville. Amazon Cotton Mills; erect addition to house 8,000 spindles and auxiliary machinery.

Thomasville. Jewel Cotton Mills; erect 80 x 150 foot main mill addition and 140 x 50 foot warehouse; install 3,000 additional spindles.

Troy. Smitherman Cotton Mills; erect 1½-story brick addition and install 160 automatic looms, 23 spinning frames, 20 cards, 3 pickers, 2 warpers, 2 slubbers, 5 speeders, 2 nappers, 1 slasher and 1 dyeing machine.

Waxhaw. Rodman Heath Cotton Mill; install new boilers and replace old machinery with new.

Weldon. Audrey Spinning Mills; erect brick addition, 80 x 100 feet to plant purchased from Shaw Cotton Mills, Inc.; add 2,000 twister spindles and overhaul old machinery.

Winston-Salem. Arista Mills Co.; add new carding, spinning and weaving machinery.

Worthville. Leward Cotton Mills; building extensions, enlargement of village, and electrification of power plant, approximately doubling capacity.

Ohio, Akron. Chemitex Products Co.; start manufacture of window shade cloth in Mogadore, near here; R. C. Hartong, president.

Elyria. American Lace Mfg., Co.; erect two-story and basement addition 42 x 120 feet.

Pennsylvania, Belleville. L. M. Yoder; build addition to carpet mill.

Chester. Aberfoyle Mfg. Co.; erect new mill addition estimated to cost $83,000.

Philadelphia. John Bromley & Sons, Inc.; erect new weaving building at N. E. Cor. A. St. and Lehigh Ave., costing $32,000; also make alterations to plant at S. W. Cor. A. and Somerset Sts., costing $2,500.

Philadelphia. Collins & Aikman Co.; erect six-story and basement mill, 50 x 90 feet, at Farson and Viola Sts.

Philadelphia. R. J. Ederer Thread Co. (Frankford); erect three-story and basement addition, 40 x 50 feet; also one-story structure, 40 x 60 feet.

Philadelphia. Elm Converting Co.; add to equipment of quillers and cone winders, increasing capacity to 45,000 pounds weekly.

Philadelphia. Henry Goldthorp Co.; erect new mill addition costing about $25,000.

Philadelphia. H. S. Henry & Co.; remove plant to Emerald and E. Hagert Sts.; 6,000 spindles for manufacture of cotton knitting and weaving yarns, 1s to 12s.

Philadelphia. Kaufman Plush Co. (Manayunk); erect new boiler house and dye house at Rector and Mitchell Sts., costing $16,600.

Philadelphia. Krout & Fite Mfg. Co.; erect new plant costing $134,000.

Philadelphia. John J. McGrath; erect new plant at 1344-48 N. Front St., costing $35,000.

Philadelphia. Philadelphia Narrow Fabric Co.; take over plant of S. D. Wright & Co.; 38 looms and 4 braiders; Michael August, president.

Philadelphia. Philip L. Sheerr & Sons; move mills and offices to own building at Orchard and Vandyke Sts., Frankford, bringing weaving and finishing departments under one roof.

Philadelphia. H. F. Walliser Co.; erect two-story and basement plant at 23d St. and Allegheny Ave.

Reading. A & B Hosiery Co.; 1405 N. 9th St.; take over plant of Court Knitting Mills; 20 knitting machines and 1 winder.

Reading. Narrow Fabric Co.; erect plant addition in West Reading.

Royersford. Wm. J. Sheehan & Co.; operate tubing mill formerly owned by Ira D. Latshaw; 40 cylinders and 30 machines; James Rafferty, agent.

Scranton. Scranton Lace Co.; erect one-story brick addition.

York. Federal Yarn Corp. (New York); purchase and operate York plant of American Fabrics Co.; cotton tape.

Rhode Island, Central Falls. Leader Weaving Co.; erect brick weave shed, approximately 155 x 60 feet.

Esmond. Esmond Mills; erect addition to weaving and bleaching departments; also two-story store house.

Pawtucket. J. & P. Coats, Inc.; erect three, one-story brick additions, each 25 x 100 feet and equip with spinning machinery.

Pawtucket. Lorraine Mfg. Co.; erect four-story mill addition, 44 x 100 feet; also 20 x 55 foot garage.

Pawtucket. Manville-Jenckes Co.; formed by merger of Jenckes Spinning Co., and Manville Co.; $39,000,000 capital; Henry F. Lippitt, president; Frederick L. Jenckes treasurer; complete addition to plant in Manville, R. I., started last year; also new bleachery in Central Falls, R. I.

Pawtucket. Potter Fine Spinners, Inc.; install additional intermediate, roving and jack frames.

Pawtucket. John West Thread Co. (Boston); purchase plant of Eastern Processing Co. and start branch plant.

Shannock. Columbia Narrow Fabric Co.; erect one-story brick weave shed addition, 180 x 60 feet.

Woonsocket. Etablissements Francois Masurel Freres; purchase Mill No. 2 of Nyanza Mills; will equip for manufacture of yarns.

South Carolina, Anderson. Anderson Cotton Mills; build additions to boiler house.

Arcadia. Arcadia Mills; erect Mill No. 2; main mill 280 x 105 feet, three stories and basement, picker building 78 x 50 feet, three warehouses 50 x 100 feet, boiler house, pump house, etc.; will house 20,000 spindles.

Calhoun Falls. Calhoun Mills; complete additions for 15,000 spindles, necessary preparatory machinery and looms (construction started last year); also erect houses for operatives.

Charleston. Williamson Mills Co.; organized to take over Royal Mills and convert plant for manufacture of colored goods; add 308 looms giving total of 500.

Cherokee Falls. Cherokee Falls Mfg. Co.; consolidated with Henrietta Mills, Caroleen, N. C. and now known as Henrietta Mills, Cherokee Falls Plant; manufacture print cloths and gray sheetings.

Clinton. Lydia Cotton Mills; erect three-story brick and timber addition, 125 x 275 feet, designed to contain 20,000 spindles and 450 looms.

Columbia. Palmetto Mill; erect three-story addition, 80 x 100 feet; install 3,376 spindles and 112 looms.

Clover. Hampshire Spinning Co.; begin operations in plant started last year; 20,000 spinning and 10,000 twister spindles.

Darlington. Darlington Mfg. Co.; install 11,766 new spindles, 262 automatic dobby looms, vertical tandem opener, waste machine, and 1,000 K. W. steam turbine (spindles and looms replace old machinery.)

Fort Mill. Fort Mill Mfg. Co.; add approximately 12,000 spindles and 350 looms; also erect 60 cottages for operatives.

Fountain Inn. Virginia Mfg. Co.; install 5,000 new spindles to replace old.

Fingerville. Franklin Process Spinning Mill, Inc. (subsidiary of Franklin Process Co.); $300,000 capital; alter and improve Cohannet Mills for production of 20-2s and 30-2s cotton yarns; E. S. Graves president.

Gaffney. Alma Mills; enlarge mill and village, adding approximately 15,000 spindles and necessary preparatory machinery and looms.

Gaffney. Derry Damask Mills; organized with J. R. Mallory, president and $100,000 capital, continue Palmetto Damask Mills.

Gaffney. Ireno Mills; install additional cards, drawing frames and spinning frames.

Gaffney. Musgrove Mills install 5,000 spindles and auxiliary carding machinery, and looms.

Great Falls. Republic Cotton Mills; build Mill No. 3 planned last year; equip with 1,000 automatic looms and auxiliary equipment; product high-grade mixed silk and cotton fabrics.

Greenville. American Spinning Co.; erect new picker house, 52 x 100 feet, one-story; purchase 42 acres of land adjoining plant; plan cloth room addition.

Greenville. Duncan Mills; erect additions to house approximately 10,000 twister spindles and 600 looms; also add 250 houses to village.

Greenville. Judson Mills; complete new weave shed addition, bringing total looms to approximately 2,000; build 195 new tenements and modern cafeteria with seating capacity of 200.

Greenville. Marion Cotton Mills Corp.; capital $50,000; take over plant of Riverdale Mills; A. B. Shuford, president.

Greenwood. Grendel Mills; erect three-story addition, 141 x 132 feet to Mill No. 2, to house about 12,000 spindles and 300 looms; also build 50 new cottages for operatives.

Greer. Victor-Monaghan Co.; erect three-story and basement addition to Victor Plant, mill construction.

Hartsville. Hartsville Cotton Mills; rearrange opening and picking machinery, adding new carding, roving and spinning equipment.

Jeresville. Wallace Mfg. Co.; capital $700,000; take over Wallace Plant of Victor-Monaghan Co.; plan improvements and additions; T. M. Marchant president.

Kershaw. Kershaw Cotton Mills; install large new boilers, pumps and filter system.

Lando. Manetta Mills, install 8 new spinning frames and 24 looms.

Lancaster. Lancaster Cotton Mill; build two-story reinforced concrete addition for weaving, warping, slashing and cloth room.

Lexington. Red Bank Mill; erect one-

story, 80 x 100 foot addition and install 2,880 spindles and 112 looms.

Newberry. Mollohon Mfg. Co.; erect two-story reinforced concrete cloth room and cloth storage buildings.

Newberry. Newberry Cotton Mills install 15,000 additional spindles and 50 40-inch looms.

Newberry. Oakland Cotton Mills add two 50 x 100 foot sections to warehouse and large opening room; increases in village.

Pelzer. Pelzer Mfg. Co.; four plants containing 136,000 ring spindles and 2,559 looms sold to Lockwood, Greene & Co., Boston, and new corporation, the Pelzer Mfg. Co. of Boston formed to take over this property; capital $7,500,000.

Rock Hill. Victoria Cotton Mills; erect new building for weaving, finishing and cloth storage; add carding and spinning equipment.

St. Matthews. Calhoun Twine Mills; rebuild plant burned last year.

Seneca. Seneca Co. (connected with Goddard Bros., Providence, R. I.); take over and operate Seneca Plant of Victor-Monaghan Co.

Spartanburg. Beaumont Mfg. Co.; erect two-story and basement building, 258 x 96 feet; will install 450 new looms and move 186 from present mill; rearrange machinery in Mills Nos. 1 and 2, and add approximately 9,000 spindles; also build 50 four room cottages.

Tucapau. Tucapau Mills; purchased by Lockwood, Greene & Co., Boston; build additions and install 6,700 new spindles and 200 22-inch looms.

Union. Ottaray Plant of the Victor Monaghan Co. purchased by Deering, Milliken & Co. being operated as Ottaray Plant of Monarch Mills.

Ware Shoals. Ware Shoals Mfg. Co.; erect new bleachery and bag factory; three stories, 320 x 80 feet.

Williamston. Williamston Mills; build one-story school building and auditorium for operatives, costing about $22,000.

Tennessee, Chattanooga. Dixie Spinning Mills; start operation of first unit of plant equipped with 14,000 spindles.

Covington. O'Cedar Mills, Inc.; erect brick and concrete dye plant, 50 x 120 feet.

Fayetteville. Elk Cotton Mills; enlarge mill, adding aproximately 4,000 spindles, preparatory machinery and twister frames.

Knoxville. Cherokee Spinning Co.; erect brick and concrete addition to house 250 looms for weaving and finishing fine ginghams.

Texas. Channel City. American Gauze & Cotton Co. (St. Louis, Mo.); purchase plant of Texas Textile Co. for branch plant.

Itaska. Itaska Cotton Mfg. Co.; erect 100 x 120 foot weave shed to house 50 72-inch looms; also 60 x 80 foot picker and card room; new spindles also installed.

McKinney. Texas Cotton Mill Co.; erect addition to weave shed and install 350 new looms; also build cloth room addition.

Virginia, Roanoke. Carolina Cotton & Woolen Mills Co., Inc.; erect one-story addition, 48 x 69 feet to be used as weaving department.

Wisconsin, Janesville. Hough Shade Corp.; erect one-story brick and reinforced concrete addition, 50 x 90 feet.

Canada, Quebec, Montreal. American Thread Co. of Canada, Ltd.; start operation of plant after extensive remodeling.

Welland, Ontario. Welland Cotton Mills, Ltd.; complete 100 x 350 foot plant started last year.

WOOL MILLS

California, Eureka. Eureka Woolen Mills; plan for 60 x 200 foot addition.

Santa Ana. Santacala Woolen Mills; organized to operate former plant of Mission Woolen Mfg. Co.; erect addition; P. A. Robinson, president.

Connecticut, Baltic. Shetucket Worsted Mills sold to Daniel Boone Woolen Mills, Inc., Chicago.

Bridgeport. Salt's Textile Mfg. Co.; erect 56 x 196 foot weave shed.

Buckland. E. E. Hilliard Co.; erect one-story, 55 x 136 foot dyehouse.

Danbury. Mallory Hat Co.; erect six-story building and three additional stories on existing structure; estimate, $100,000.

Mechanicsville. French River Textile Co.; plant purchased by Guerin interests and renamed Beachmont-Guerin Mills, Inc.

Norwich. American Woolen Co.; erect two reinforced concrete additions, 105 x 125 feet and 70 x 125 feet.

Shelton. Sidney Blumenthal & Co.; erect three, four-story reinforced concrete additions, 53 x 100 feet, 60 x 75 feet, and 16 x 50 feet; purchase plant of Uncasville (Conn.) Mfg. Co. and arrange to convert into mohair mill.

South Norwalk. Crofut & Knapp Co.; erect new plant consisting of five reinforced concrete buildings estimated to cost $1,000,000, increase capital stock from $1,000,000 to $2,500,000.

Thompsonville. Bigelow-Hartford Carpet Co.; erect four-story brick and steel addition, 475 feet long, to axminster rug weaving mill; also addition to finishing building, four stories, 90 x 305 feet.

Georgia, Rossville. Peerless Woolen Mills; additions to care for 1440 new spindles, four sets of cards and additional dyeing equipment.

Illinois, Chicago. Daniel Boone Woolen Mills; erect one-story L-shaped addition, 70 x 265 feet and 92 x 150 feet, costing approximately $100,000; now operate 185 looms.

Iowa, Clarinda. B. W. Freeman; erect second story to rug plant.

Davenport. Daniel Boone Woolen Mills Co.; erect plant at Eighth and Harrison Streets, having 31,360 sq. feet of floor space.

Nashua. Nashua Woolen Mills; rebuild portion of plant destroyed by fire with loss estimated at $500,000.

Kentucky, Louisville. American Woolen Co.; will start immediate construction of four-story addition to Bradford Mills here, to cost $150,000.

Louisville. Louisville Woolen Mills; build one-story and basement mill addition, 45 x 100 feet, costing about $42,000.

Maine, Camden. Camden Woolen Co.; erect one-story, brick dyehouse, 60 x 70 feet.

Kezar Falls. Kezar Falls Woolen Co.; install 16 looms and other additional equipment.

Sanford. Sanford Mills; erect new reinforced concrete mill, 236 x 80 feet, five stories high, adjoining old mill.

Maryland, Sykesville. Melville Woolen Co.; erect two-story addition to plant; also install oil burning engine, 250 H. P. generator, and two 150 H. P. boilers.

Massachusetts, Clinton. Bigelow-Hartford Carpet Co.; complete new one-story dyehouse, started last year, and install 48 yarn dyeing machines (provision made for 13 additional); erect new coal and ash pockets.

Clinton. Earnsdale Worsted Co.; erect addition to mill on Stone St.

Clinton. Roubaix Mills, Inc.; erect addition to finishing plant and dyehouse.

Fitchburg. Star Worsted Co.; erect new four-story brick and steel mill, 67 x 125 feet, on West St.

Hinsdale. Hinsdale Woolen Mills; purchased by Francis H. Holmes of New York; old machinery repaired and new added; install new engine; operations to start with 2 boilers, 8 cards, 2 pickers and 40 looms.

Holyoke. Germania Mills; erect $300,000 addition to plant on South St.

Lawrence. George E. Kunhardt Corp.; new dyehouse and wool storage building, brick, one story, 240 x 150 feet.

Lowell. J. M. & E. M. Abbot, Ltd.; purchase Nos. 9 and 10 Mills of old Bigelow-Hartford Carpet Co. on Market St. and equip for manufacture of worsted yarns.

Millbury. Felters Co., Inc.; erect new dyehouse and enlarge other buildings; acquire about 25 acres of land at Michigan Center, near Jackson, Mich., and start new plant there, employing about 30 operatives.

Millbury. Millbury Mills No. 1, containing 18 looms, sold to Henry K. Greenwood and Augustus C. Neff, who do commission weaving under name of Millbury Weaving Co.

Northboro. Northboro Woolen Co.; incorporated with capital of $100,000; successors to Taylor Mfg. Co.; Clair S. Taylor, president; operates 66 looms.

North Oxford. Gordon Woolen Mills, Inc.; take over Ivanhoe Woolen Mills and install additional looms bringing total to 50, also add 3 sets of cards and 2 pickers; Newton A. Gladstone, president.

Oxford. David N. Taft; build new weave shed, 65 x 75 feet, for Bernon Mill; equip with 96 looms, also improve boiler room and install new boiler.

Pittsfield. Berkshire Woolen Co.; purchase old J. L. & T. D. Peck Mfg. Co.'s plant for $12,000.

Shawsheen Village, (Andover) American Woolen Co.; remove executive offices, purchasing, yarn, waste, wool and mill departments from Boston, and chemical and engineering departments from Lawrence to new Shawsheen administration building; purchase worsted mill of S. Slater & Sons, Inc., South Village, Webster, Mass., and incorporate under name of Webster Mills, installing new equipment; purchase Black River Woolen Co., Ludlow, Vt.; purchase Strathmore Worsted Mills, Concord Junction, Mass.; erect six-story mill addition to Washington Mills, and complete central power plant, in Lawrence; erect new five-story brick and concrete mill, 60 x 120 feet, at Boston Ave. and North St., Medford; build addition to boiler plant of Wood Worsted Mill in Lawrence.

Southbridge. Hamilton Woolen Co.; erect two new storehouses, 60 x 100 feet; purchase Fiskdale (Mass.) Cotton Mill from Fiskdale Finishing Co., remodel and equip with 16 spinning frames and one set of drawing machinery; also purchase plant of Central Mills Co.; build three-story brick addition to mill on River St., to be equipped for cleansing wool.

Upton. Smith Mills, Inc., Milford, Mass.; erect branch plant in Upton.

Uxbridge. Stanley Woolen Co.; erect three-story addition to Calumet Mill for expansion of carding, weaving and finishing departments.

Uxbridge. Uxbridge Worsted Co.; build one-story power house and picker house addition, 48 x 53 feet; this and the Millbury, Glenark, Lowell and Rivulet Mills combined in one corporation.

Ware. Ware Woolen Co.; erect new dyehouse and finishing building, brick and reinforced concrete, 100 x 112 feet.

Warren. A. L. Sayles & Sons Co.; extensive alterations, including remodeling of boiler room, installation of three new boilers and a hot-water system; remodel roof of dyehouse; complete plans for new stock building.

Webster. Maanexit Spinning Co.; incorporated with capital of $96,000; purchase Perry Yarn Mills and start operations; Stella M. Anderson, president; 8 sets and 3,120 spindles.

Winchendon. Bullardville Mills; purchased by Joseph Rome of Boston, who starts operating.

Worcester. Queensbury Mills, Inc.; purchase former plant of Whitcomb-Blaisdell Machine Tool Co. and use for expansion.

Worcester. M. J. Whittall Associates; erect new dyehouse, power house and boiler room, adding 37,500 square feet of floor space to plant, build one-story, 20 x 54 foot waiting and lunch room costing $10,000; also reinforced concrete coal pocket costing $10,000.

Michigan, Columbiaville. Columbiaville Woolen Co.; add story to east end of plant, making it three stories high.

New Hampshire, Bristol. Dodge-Davis Mfg. Co.; install new set of cards.

Charlestown. Charlestown Woolen Co., Inc.; unite two buildings recently purchased, and build addition, making entire length of plant 457 feet.

Penacook. Harris Emery Co. (Dustin Island Woolen Mills); erect four-story brick mill, 80 x 55 feet; two-story, 120 x 35 foot addition to dyehouse; and one-story, 65 x 40 foot boiler house.

Tilton. Elm Mills, Inc.; purchase A. D. Carter Mills and equipment and operate as branch plant.

New Jersey, Passaic. Tuxedo Mills; sold to Christian Bahusen, president of Gera Mills, for $18,500.

Roselle Park. A. & M. Karagheusian, Inc.; take over plant of Bridgeport Atlantic Spinning Co., Inc., Bridgeport, Pa., and move machinery to local mill where a spinning department has been established.

New York, Amsterdam. Mohawk Carpet Mills, Inc.; Shuttleworth branch, erect three-story, reinforced concrete cotton yarn plant 200 x 200 feet and six-story addition to Wilton department, 100 x 160 feet; McCleary, Wallin & Crouse branch, addition to picker room; four-story addition to dyehouse; new power house costing about $250,000.

Amsterdam. Stephen Sanford & Sons, Inc.; complete ten-story warehouse; start extensive housing project.

Jamestown. Acme Worsted Mills; erect new weave shed addition.

Jamestown. Jamestown Worsted Mills; erect new dyehouse and four-story, 75 x 175 foot brick, concrete and steel combing and spinning mill.

Newburgh. Crawshaw Carpet Co.; award contract for two-story addition, 50 x 106 feet, for manufacturing and warehouse service.

Newburgh. Hudson River Woolen Mills; reconstruct and add to several existing buildings.

Rensselaer. Valatie Yarn Co., Inc.; take over entire building on Green St., owned by Harder Mills Co.; install additional machinery.

Stottville. Atlantic Mills; build weaving room addition two stories high, 208 x 68 feet.

Yonkers. Alexander Smith & Sons Carpet Co.; erect two four-story mill additions; also addition to Mill No. 9, comprising two-story structure, 26 x 152 feet, with one-story portion 30 x 100 feet.

Pennsylvania, Bridgeport. Hosey Worsted Co.; acquire building on Front St.; remodel and equip as branch plant.

Bloomsburg. Magee Carpet Co.; erect three-story spinning mill, 70 x 118 feet.

Carlisle. C. H. Masland & Sons; award contract for three-story addition to be used for finishing and storage purposes.

Esterly. American Worsted Mills; erect brick addition and install 50 new looms.

Philadelphia. Artloom Rug Mills; erect new five-story mill at Mascher and Westmoreland Sts.

Philadelphia. Barrymore Seamless Wiltons, Inc.; purchase mill property at Holmesburg Junction and equip with wool scouring, combing, carding and spinning machinery, and erect new dyehouse (operate in conjunction with Philadelphia plant); install additional looms in Philadelphia plant.

Philadelphia. Beswick & Clay Co., Inc.; erect new mill at Greenway Ave. and 68th St. and transfer equipment from plant on Callowhill St.

Philadelphia. Cambria Carpet Co.; move plant to Randolph and Jefferson Sts., where additional looms are installed.

Philadelphia. John & James Dobson, Inc.; alterations in Bradford Mills, Germantown, costing $3,500; erect one-story building with about 3,000 square feet of floor space at Ridge Ave. and Crawford St., Manayunk, costing about $40,000, to be used as fulling mill for blanket plant.

Philadelphia. Edgley Worsted Mills, Inc.; succeeded to business of Bennett Textile Mfg. Co.; commission weaving, men's worsted wear.

Philadelphia. S. B. & B. W. Fleisher, Inc.; purchase from Corticelli Silk Co. the rights to all Corticelli brands of hand knitting yarns.

Philadelphia. John P. Holt, Inc. (Manayunk); erect four-story warehouse costing $65,000.

Philadelphia. John B. Stetson Co.; erect plant addition costing about $60,000.

Philadelphia. Kensington Mills, Inc.; take over plant of Copeland Mills, Inc.; remove to 4th and Cumberland Sts.; operate 20 looms on commission weaving, men's wear and dress goods.

Philadelphia. T. Kenworthy & Bro.; make alterations and improvements in yarn mill, costing approximately $7,500; also erect tank costing $25,000.

Philadelphia. C. H. Masland & Sons, Inc. rebuild portion of plant destroyed by fi with loss estimated at $6,000; make alterations.

Philadelphia. Pennsylvania Axminster Carpet Co.; erect one-story addition to dyhouse; estimated to cost $20,000.

Philadelphia. Pollock-Huston Co.; erect four-story and basement addition.

Philadelphia. Frank Schoble & Co.; erect one-story power house, 47 feet 7 inches x 70 feet 6 inches, costing $36,000; also coal trestle; costing $13,000.

Philadelphia. Spruce Worsted Co.; remove to new plant at 73d St. and Elmwood Ave.; increase equipment to 2,200 spinning and 1,120 twisting spindles.

Philadelphia. Sykes Bros.; erect addition to plant costing about $5,000.

Philadelphia. Vernon Textile Co.; move to new and larger quarters at 4554 Torresdale Ave., Frankford; install 10 additional looms.

Philadelphia. Wm. F. Read & Sons erect five-story addition, costing about $105,000.

Tunkhannock. Wyoming Worsted Mills; capitalized at $60,000; successors to Tunkhannock Worsted Yarn Co., Inc.; continue production of knitting yarns from 2-18s to 2-32s; N. B. Kneass Brooks, president.

Rhode Island, Bristol. Cranston Worsted Co.; erect five-story mill addition, 64 x 122 feet.

East Greenwich. Greenwich Mills; erect one-story, brick weave shed addition, 60 x 80 feet.

Oakland. Glengarry Mills; sold to John V. Clement and chartered under name of Craigeith Mills, Inc.

Providence. Colored Worsted Mill; erect addition to mill on Pitman St.

Providence. Rochambeau Worsted Co.; start manufacture of merino yarn at Olneyville (construction of mill started last year); 6,000 spindles; Louis Lepoutre, president.

Woonsocket. Fairmount Worsted Corp.; erect new mill on Mendon Rd.

Woonsocket. French Worsted Co.; construct one-story and basement brick sawtooth roof mill addition; also one story machine shop and connecting tunnel.

Woonsocket. Guerin Mills, Inc.; build spinning and carding addition to Riv Mill, costing about $80,000.

Woonsocket. Jules Desurmont Worsted Co.; erect four-story and basement reinforced concrete mill addition, 130 x 110 feet.

Woonsocket. Lafayette Worsted Co.; erect reinforced concrete grease house, one story, 50 x 80 feet; also one-story stor house.

Woonsocket. Verdun Mfg. Co.; purchase Scotia Worsted Mills and operate a branch plant.

Woonsocket. Woonsocket Worsted Mills erect three-story mill addition, 58 x 2 feet.

Tennessee, Athens. Athens Woolen Mills erect weave shed addition to house about 200 new looms.

Lebanon. Lebanon Woolen Mills; erect three-story addition, 50 x 65 feet, and two-story addition, 63 x 74 feet.

Sweetwater. American Textile Woolen Co.; erect weave shed addition, 62 x 194 feet of brick and steel; rearrange equipment.

West Virginia, Bunker Hill. Dunn Woolen Co.; erect 36 x 200 foot reinforced concrete mill here and discontinue operation of Brucetown (Va.) plant.

Athens Woolen Mills

Building New Weave Shed and Adding to Carding

Extensive enlargements and improvements are being made by the American Textile Woolen Company at Athens Woolen Mills, Athens, Tenn., including the erection of a new weave shed and alterations in the card room. Increased space will be provided for additional machinery and an improved layout of plant departments of this unit will be effected.

The new weave shed adjoins the old mill of the company and is built to house 200 looms. The structure is 69-ft. by 194-ft. in size and entirely free from columns. The floor is of tar-rock concrete laid directly on the ground and finished with a maple floor. Steel trusses spaced 16-ft. on centers carry the roof construction which consists of wood purlins and 2-in. mill sheathing, with a built-up composition roof.

W. H. Sears, Chattanooga, Tenn., is the architect-engineer for the American Textile Woolen Company in this development.

Financial Review

Boom for End of Year

By *S. M. D. Clapper* *

I think there is very little in the past to justify any feeling that the mere fact that this is a presidential year will have any effect on business in any way at all.

In the textile business particularly, e think prices have been liquidated such an extent, and stocks have en cleared out to such a low point, at while the present quietness may evail for another few months, the st half of this year will see a very cided boom in textiles. We believe this in spite of the fact that it is a presidential year, and we do not believe that the mere fact that it is a presidential year will have the slightest bearing at all.

Except for the fact that new crop cotton is selling at such a tremendous discount, we believe it would be difficult to withhold a moderate textile boom right now. Another weakness in textiles as a whole, is undoubtedly the fact that there are just a trifle too many goods produced in most lines, except in those lines where the demand is unusually full.

President, Cotton Yarn Merchants' Association, ladelphia.

No Precedent for Disaster

By *Lincoln Cromwell* *

HE records of William Iselin & Co. do not support the notion at a presidential election year cessarily slows down business. ur records show that 1900, 1912, 16 and 1920 were all prosperous ars, each showing the normal increase in total sales over the preced- g year. Nineteen hundred and four nd 1908 were dull years for the ry goods business, but 1903 saw the ollapse of a speculative craze, and there was another Wall Street panic 1907. The disturbed credit conditions caused by these upsets rather than the presidential election, are to be blamed for dull business which followed. There was no political uncertainty in 1904 when President Roosevelt's election was a foregone conclusion, nor in 1908 when Mr. Taft was elected by a landslide.

Our sales show the combined business of a large group of silk, woolen, cotton, and knit-goods manufacturers, and are a safe index from year to year of the general course of the dry goods business. I find nothing in them to suggest any apprehensions that 1924 business will be set back by the presidential election. Give the dry goods business plenty of seasonable weather, and it will take very little time off to think of politics.

Of William Iselin & Co., Dry Goods Commission Merchants, New York.

Business Satisfied with Coolidge

By *Ellison A. Smyth* *

USUALLY the election in a Presidential year causes a disturbance in the political party identified with the present Administration often forestalls a different financial policy; but this year the business world is so well satisfied with the present Administration and so hopeful of President Coolidge's reelection that the usual symptoms of distrust and fear are lacking.

In the cotton goods trade, however, apart from any political influence, the scarcity of raw cotton, the abnormally high prices for the raw material, and the inability of cotton manufacturers to sell goods at a price that the trade wants and which would not cause a too great loss to the manufacturers, is the disturbing element. We are experiencing a scarcity of raw material with the possibility of a larger crop to be made during the coming year, and the high prices for cotton now prevailing may not be in evidence next fall. Hence the uncertainty and distrust.

* Greenville, S. C.

Wool Conditions Sound

By *Sidney A. Eisemann* *

THE uncertainty as to which political party will emerge victorious in any presidential election year naturally must inject a certain amount of caution with regard to the commitments of almost every business. You can readily understand that the policy to be laid down in any of the subdivisions of the wool manufacturing industry must depend largely upon whether tariff protection or free trade is to prevail.

Intrinsically, present world wool values are based on a solid, unassailable foundation. More wool is being consumed than is being produced, and there are no surplus stocks of wool anywhere in the world today. Owing to this situation, we shall simply have to become reconciled to the fact that the cost of clothing will continue to play a part in the increased cost of living.

The economic position of wool seems to me to be strong enough to resist any material decline which might ordinarily be expected to result from political uncertainties.

* President, Boston Wool Trade Association.

Normal Activity in 1924

By *Eugene H. Mahler* *

OUR opinion is, that 1924 will be characterized by normal activity. That is, there will be no abnormal activity nor depression.

This opinion is not affected by the fact that 1924 is a presidential year, but to the following:

First: Reation from the abnormal activity of the Spring of 1923.

Second: The effect of the mild weather previous to the holiday season.

Third: As a consequence, merchants seem to be in a conservative mood.

* President Knitted Outerwear Manufacturers Association (Western District.)

Coolidge Sound and Sane

By *A. L. Gifford* *

OWING to the general confidence in the soundness and saneness of President Coolidge, and the widespread belief that he will be our next President, I do not believe conditions will be adversely affected by the national election.

* President American Association of Woolen and Worsted Manufacturers.

COMPARATIVE VALUES OF TYPICAL NEW ENGLAND TEXTILE SHARES, 1914 AND 1916 TO 1924, SHOWING HIGH AND LOW FOR EACH YEAR.

	1923			1922		1921		1920		1919		1919		1917		1916		1914	
	Dec. 31.	High.	Low.	High.	Low.	High.	Low.	High.	Low.	High.	Low.	High.	Low.	High.	Low.	High.	Low.	High.	July.
American Woolen, pfd	100	118⅛	97	111⅝	102	104	91	105¼	92	109½	94⅛	99½	89	100¼	87¼	99¾	92½	82¼	74½
Amoskeag, com	74	112	67½	117	106	104	†72	*167	75½	150	89	90	60½	75	60	77½	66	65	58½	62
Androscoggin	100⅝	116½	100⅛	141	119	125	†119	*225	193¼	193¼	180	190	178	195¼	190	201	180	137	135¼	137
Arlington	142¼	175	142¼	114½	90½	109	90½	172⅜	89	141¼	109	126½	106⅞	120	106⅞	120½	100	80	74¼	80
Bates	235¼	263	235½	273	190⅛	211⅝	183	315⅛	195	272	265	275	251	260	258⅛	293¼	240	220¾	213¼	213¼
Begelow-Hartford, pfd	114¼	119¼	114¼	119¼	93⅜	122⅛	92⅜	111	93	100	83¼	89½	80½	85	85	112	106½	....	....	....
Great Falls	36	77½	33½	120½	75⅝	147½	119½	241	131	219	177	195½	177	215	194	201⅜	187¾	180	168	170⅝
Hamilton Mfg	46½	85	46½	92½	63	120	†70	*187⅝	140¾	155	109	115	90	99	98	87½	73	83	75	75
Lyman	166⅛	183¼	166½	186½	162½	180	162½	190½	175	176½	132	140	131⅛	133	133	126½	122½	120¾	112	120
Mass. Cotton	149	174½	149	158½	146	148¼	132⅞	167⅜	132½	145	118	142	126	140¼	122	140	123	116	115½	116
Merrimac, com	100⅛	107⅞	100½	104½	90⅜	102	74	125½	100	117	66⅝	78	60⅜	63⅛	58	†54½	32	*20⅛	24½	24⅝
Nashua, com	77¼	79	71¼	85	73	89½	†88	*260½	165⅛	310	†230	*855½	798	804	798	821	750	672½	620	672½
Naumkeag	†168⅝	*315	255	280¼	210¼	208	189¼	241½	195	222¼	163	195½	154	206¼	190	†210½	185	*198¼	172	172
Pacific	84	100	84	190	159	170	147	175	†160	*190	150	155	129	181	127	181⅜	126	112½	106	110
Pepperell	139	167½	134	180	164⅜	202	178	229	200	210	188	206¼	190	204	188	194½	†120⅞	*205⅝	200	205
Tremont & Suffolk	100	155½	100	165½	135	190	125	281	190	280¼	157½	158	137½	142½	139	140½	112	102	100	100⅜
York	122	230	120¼	220	195	235	195	226	133½	190	110	133½	110	126	113	115½	95¼	85¼	85	85

*Old stock. †New stock.

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Satisfactory Year in New Bedford

Although Dividends Were Materially Lower, Financial Progress Good in View of Difficulties

NEW BEDFORD, MASS.

THE New Bedford cotton mill corporations came through the past year much more successfully from a financial standpoint than appeared likely at the beginning of 1923, and with few exceptions paid regular dividends to their shareholders in each of the four quarters. This was particularly true of the cloth mills, which in most cases more than earned the disbursements that were made. The yarn mills were not so fortunately situated, and in the case of two corporations it was necessary to pass the dividend in the third and fourth quarters, while a third one failed to pay any yield in the last quarter.

Average Dividend Much Smaller

Considering the depressing period that was experienced by textile mills in general, the average dividend for a year that was generally regarded as the poorest since pre-war days, was quite satisfactory when it figured out to approximately $7.50 per share. This yield is of course the smallest in many years, and considerable under the average of $11.46 for the past 10 years. The total amount distributed was $5,030,750 compared with $5,998,328 the previous year, when the lower capital stock made for an average dividend of approximately $10 per share.

The net quick surplus of quick assets over liabilities credited to New Bedford mills at the end of 1923 amounted to $38,379,517 on a capitalization of $67,746,935, slightly less than the quick surplus of $39,577,058 existing at the end of 1922 on a capital of $59,417,700. At the end of 1922 there was a net debt of $542,570 on the Nashawena plant which in 1923 was turned to a net quick surplus of $1,224,941, making every corporation free of debt.

Few Alterations to Plants

Few of the corporations made any changes of note in the way of new buildings or additions to their plants, the total amount spent on alterations being estimated at less than $50,000. Several of the mills installed new machinery to replace the older equipment, this being particularly the case at the Wamsutta Mills, where the changes extending over the past three years are being rapidly completed. With the exception of the Nashawena with 33⅓%, there were no stock dividends declared, though the total capitalization was increased by $10,516,700 as a result of the stock dividends that had been made in the closing stages of 1922, making the present capital outstanding $72,251,900.

The number of employes now carried on the payrolls is 41,530, an increase for the year of 170, and the number of spindles in the various mills is 3,571,254, a decrease of 22,344. The number of looms totals 54,017, or 450 less than the previous year. The peak of employment was at its highest during April, when approximately 38,000 operatives were employed, while in December the number had decreased to 33,000, or almost 3,000 less than the corresponding period of the previous year. The increase at the peak was almost 6,600 over the lowest point for a number of years, this being in January, 1921.

High and Low on New Bedford Mill Stocks
(From Sanford & Kelley)

	—1923— High	Low	—1922— High	Low
Acushnet Mills	157½	115	180	155
Beacon Mfg. Co pfd.	103	99	101	90
Booth Mfg. Co. com.	190	168	175	144
Booth Mfg. Co. pfd.	118	112	115	107½
Bristol Mill	208	150	195	140
Butler Mill	155	127	153	140
City Mfg. Co.	157	125	160	147½
Dartmouth Mfg. Co. com.	170	146	300	250
Dartmouth Mfg. Co. pfd.	91	85¼	88	79½
Fairhaven Mills com.	96	40	155	120
Fairhaven Mills pfd.	100	50¼	100	87
Gosnold Mills com.	142	119	137½	111*
Gosnold Mills pfd.	101	91	100	83
Grinnell Mfg. Corp.	145	130	150	127½
Hathaway Mfg. Co.	160	160	No Sales	
Holmes Mill com.	275*	270*	300	250
Holmes Mill pfd.	119	112	119	116
Kilburn Mill	189	155	300	215
Manomet Mills	103	47¾	115	96
Nashawena Mills	149	107	150½	115
Neild Mfg. Co.	250	235	325	268

Wide Fluctuation in Values

Dealing in mill shares was quite as heavy in volume as in 1922, though the fluctuations in values were of a wider range than for many years. The low figures in most instances came towards the end of the year, and were of a general nature, many of the so-called favorite stocks showing a decline along with issues of some of the yarn mills that had been extremely hard hit by adverse conditions in the trade. In many instances, however, shares were held considerably higher than the low of the previous year, when allowance is made for the stock dividends that had been declared at the end of 1922.

The largest dealing noted in any of the mill shares was in Manomet, followed in order by Wamsutta, Nashawena, Nonquitt, Bristol, Gosnold preferred, Kilburn, and Sharp common. Dartmouth common, which in 1922 sold at 250 as the low, did not fall below 146 in 1923, and allowing for the stock dividend of 100%, this was equivalent to 292, an advance of 42 over the previous year. Under similar condition, Kilburn was up 17½, Neild 84½, Quissett common 104½, Taber 16⅓, Wamsutta 27½ and Whitman 41¼. Nashawena also sold higher after allowing for the stock dividend of 33⅓%, the margin being 38 points.

Quissett common also showed the largest decrease between the high and low marks for 1923 with a fluctuation of 105, Fairhaven common losing 56 points, Fairhaven preferred approximately 50, Sharp common 57, and Manomet 55. Kilburn showed a rise and fall of 34, Pierce 51, Potomska 45, Soule 28, Taber 13½, Wamsutta 15 and Whitman 17½. Acushnet dropped 31½, Bristol 53, Butler 28, City 27, Dartmouth common 24, Gosnold common 23 and Nonquitt 25, Holmes common holding firm throughout the year with a variation of but 5 points, while the Holmes preferred issue was held to a margin of 7 points.

Manomet, Sharp common and preferred, and Fairhaven common and preferred, all of which except Sharp preferred, passed up their dividends in at least one quarter, were the hardest hit of any, and sold at the lowest points in their history, while Acushnet, Potomska and Wamsutta sold at their lowest point in 22 years. Dartmouth common changed hands at the lowest figure since 1915, and Quissett and Whitman the lowest since 1918, all of these corporations having declared large stock dividends in 1922, which accounted for the big drop in price. In the closing days of the old year stocks in general were selling a little higher than their low point, and there was a feeling that the bottom figure had been touched, this being strengthened by a scarcity of shares offered for sale.

Outlook Appears Brighter

The outlook for the cloth mills of this city is considered much brighter than was true a year ago, especially in the case of such of the corporations as purchased a fair supply of raw cotton to insure the operation of their plants. The fact that some of the New Bedford mills were able to operate throughout the year at something like normal capacity was due in a large measure to the cheapness of extra staple cotton compared with the more ordinary cotton used in such large quantities by the mills manufacturing coarser goods, enabling the buyer to get much better value for his money than was the case in cloth goods manufactured in other centers.

The yarn mills of the city did not fare so well as the cloth mills, due in a large measure to the falling off in demand for tire yarns. Improvement along this line is expected to give better employment to the operatives than was the case in 1923, and from the manner in which some of the orders have been coming in of late, resulting in the starting up of additional machinery at some of the plants, the prospect takes on a better outlook than prevailed last year at this time.

Statements Show Profits

Several of the corporations that held their annual meetings previous to the end of the year showed that the disbursements made during 1923 had been more than earned, and operations had resulted in adding somewhat to the net surplus of quick assets. The financial statement of the Wamsutta Mills showed earnings of $800,000, which figured earnings of approximately $3.50 per spindle, exclusive of taxes and depreciation.

The Bristol Mill showed earnings for the year of $23 per share or $11 more than was paid in dividends.

New Bedford Dividends in 1923

Corporation	Capital	Rate	Amount
Acushnet	$2,000,000	7	$140,000
Beacon, pfd.	1,000,000	6	60,000
Booth, com.	852,800	8	68,224
Booth, pfd.	344,100	6	20,646
Bristol	1,000,000	12	120,000
Butler	A2,200,000	8	B172,000
City	750,000	8	60,000
Dartmouth, com.	4,000,000	9	360,000
Dartmouth, pfd.	600,000	5	30,000
Fairhaven, com.	1,500,000	3	45,000
Fairhaven, pfd.	2,000,000	4½	90,000
Gosnold, com.	1,650,000	8	132,000
Gosnold, pfd.	1,650,000	6	99,000
Grinnell	1,500,000	10	150,000
Hathaway	2,000,000	7	140,000
Holmes, com.	600,000	18	108,000
Holmes, pfd.	600,000	8	48,000
Kilburn	2,250,000	8	180,000
Manomet	8,000,000	3	240,000
Nashawena	C4,500,000	8	360,000
Neild	1,200,000	14	168,000
N. B. Cotton, pfd.	750,000	6	45,000
Nonquitt	4,800,000	6	288,000
Pierce Mfg. Co.	600,000	32	192,000
Potomska	1,800,000	D21	408,000
Quissett, com.	2,000,000	8	160,000
Quissett, pfd.	305,000	6	18,300
Sharp, com.	2,656,000	2	53,120
Sharp, pfd.	1,161,000	6	69,660
Soule	1,250,000	8	100,000
Taber	1,600,000	8	128,000
Wamsutta	6,000,000	6	360,000
Whitman	3,000,000	11½	345,000
	$66,228,900		$4,958,750

A. Absorbs Nemasket Mills.
B. Paid on $2,000,000 in first two quarters.
C. Capital increased later to $6,000,000 by 33⅓ per cent stock dividend.
D. Extra of $25 paid on old capital of $1,200,000.

Fall River Not All Prosperous

Fine Mills Fare Better Than Coarse During 1923 — Latter Meet Southern Competition Only Indifferently

(By Our Regular Correspondent)

FALL RIVER, MASS.

THE fine goods mills of this city have earned and paid dividend rates during the past year corresponding to those paid for the previous year and five of them paid extra dividends in the same time from accumulated earnings, but the coarse goods mills as a whole have lost money and would have lost considerably more had they operated steadily. The operatives practically forced an advance in wages early in the year and lost thereby in the end as the advance in wages with that of the price of cotton increased the curtailment sufficiently to more than offset the wage total including the increase. The curtailment, however, was largely confined to the plain goods mills which have not been able to meet Southern competition as well as have the fine goods mills. The expectations that conditions in the textile industry locally would improve with the opening of the new year have not materialized as yet and a lean six

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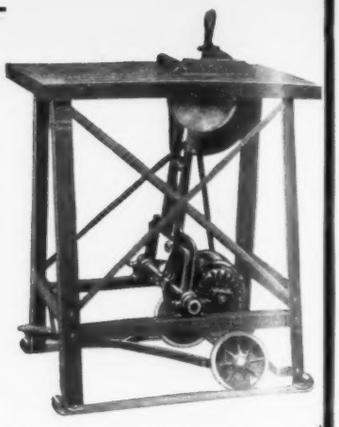

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months is now feared. These unfavorable conditions have materially affected the value of Fall River mill stocks and many of the issues now show a drop of many points for the year.

The mills paid an average dividend rate of 9.324% on invested capital rate but that was largely due to the extra dividends paid by a few of the corporations, as several of them passed dividends for the entire year and the latter have further reduced their resources so that the outlook for the immediate future is far from bright.

Many Changes in Management

The year was marked by the number of changes made in the management of individual plants through deaths and resignations, and the adoption of the policy of giving the management to men who have proved successful manufacturers. The first change came early in the year, Herbert Horton being succeeded as treasurer of the Troy by J. Edward Newton, the successful treasurer of the Barnard Mfg. Co. The death of Benjamin B. Read in mid-summer deprived the Lincoln Mfg. Co. and the Parker mills of an able treasurer and the vacancies were filled by the election of Israel Brayton treasurer of the Lincoln and Leonard S. Chace treasurer of the Parker. Both Mr. Brayton and Mr. Chace are without prior experience as mill treasurers but they have been in close touch with the textile industry in this city for years. Mr. Chace has been one of the city's largest dealers in mill supplies for a number of years and Mr. Brayton has served as counsel for a number of the corporations for several years while both have served as directors in different mills.

Still another severe loss to the industry locally was occasioned by the death of Randall N. Durfee, treasurer of the Border City Mfg. Co. The vacancy occasioned through his death was filled by the election of William L. S. Brayton who continues as treasurer of the Sagamore Mfg. Co., which has been a money maker despite conditions.

The other changes in management during the year were caused by the retirement of Herbert H. Marble as treasurer of the Arkwright, James T. Milne as treasurer of the Osborn and Thomas B. Bassett as treasurer of the Stafford while William N. McLane has been relieved temporarily from the management of the Seaconnet. Richard B. Chace has succeeded Mr. Marble at the Arkwright and retains the management of the Shawmut and James Sinclair has added to his duties as treasurer of the Charlton by taking charge of the Osborn. Edward Barker, treasurer of the Flint, has also taken charge of the Stafford and the Seaconnet has been under the management of a directors' committee to effect a reorganization.

The Sagamore Mfg. Co. paid 14%

Certain Good Earnings

on capital increased by a stock dividend during the previous year and its stock has sold as high as $300 per share and at no time during the year has the stock been quoted lower than 290. The earnings of the corporation for a long period of years together with the fact that a surplus of $2,900,000 was shown by the last annual statement justifies the high selling price of the stock. The Sagamore is admittedly one of the best paying mills in the North today.

The King Philip mills paid regular quarterly dividends of 1½% together with an extra of 25% and showed substantial earnings though not as large as for the previous year. The corporation still has a healthy surplus and the plant is one of the few that has been operated steadily throughout the year. There have been very few fluctuations in the price of the stock, it having ranged from 170 to 185 throughout the entire year. Simeon B. Chace, the treasurer, is rated as one of the best manufacturers in New England, though he did not make as good a showing with the Tecumseh. The latter continued its regular quarterly rate of 1½% but was forced to curtail heavily.

High and Low on Fall River Mill Stocks

	—1923—		—1922—	
	High	Low	High	Low
Am. Linen Co.	89	62½	98	82
Ancona Co. pfd.	No Sales		No Sales	
do com.	No Sales		No Sales	
Arkwright Mills	47½	42	72½	65
Barnard Mfg Co.	110	102	140	115
Border City Mfg. Co.	124	92	160	125
Bourne Mills	160	145	155	133
Chace Mills	105	80	127	105
Charlton Mills	135	125	180	150
Conanicut Mills	No Sales		No Sales	
Cornell Mills	170	165	230½	210
Davis Mills	115	95	122	94
Davol Mills	133	107½	132	100
Flint Mills	170	150	240	191
Granite Mills	115½	94	117	100
King Philip Mills	185	170	205	125
Laurel Lake Mills com.	46	30	58	40
Laurel Lake Mills, pfd.	No Sales		105	100
Lincoln Mfg. Co.	122	97½	140	115
Luther Mfg. Co.	No Sales		No Sales	
Mechanics Mills	126	100	145	115
Merchants Mfg. Co.	190	125	185	150
Narragansett Mills	135	125	128	115
Osborn Mills	113	90	115	95
Parker Mills com	57½	40	55	25
do pfd.	100	79	100	85
Pilgrim Mills com.	172½	127½	130	125
do pfd.	115	100	105	102
Pocasset Mfg Co	88¼	65	95	71
Richard Borden Mfg. Co.	165	120	160	130
Sagamore Mfg. Co.	415*	280	410	315
Seaconnet Mills	46	13	45	35
Shove Mills	85	77	95	75
Stafford Mills	96	84	125	105
Stevens Mfg. Co.	150	125	149	127
Tecumseh Mills	180	135	185	165
Troy C. & W. Mfg. Co.	No Sales		700	600
Union Cotton Mills	180	137½	230	180
Wampanoag Mills	145	90	150	130
Weetamoe Mills	100	80	112½	90

* Old Stock.

Fluctuations in Leading Stocks

The stock of the Border City dropped several points upon the death of Treasurer Randall N. Durfee but it recovered more than it lost when it become known that Mr. Brayton had consented to take the management of the corporation. The capital stock was increased by a 50% stock dividend late in 1922 and 6% was paid following the increase. There has been a good demand for the stock ever since Mr. Brayton's election as treasurer and the same dividend rate can be assured for some time to come even without any increase in earnings.

The Parker mills have not paid any dividends since reorganization but at the time of his death Treasurer Read had the plant fairly well reestablished on a sound commercial basis and his successor, Mr. Chace, is looked upon as the one man who can successfully carry on the work. Though not an experienced manufacturer Mr. Chace is familiar with the mill business and an exceptionally smart business man, such as is needed in the position. The price of the Parker preferred stock has fluctuated between 80 and 100 and that of the common has been as high as 57 and as low as 40. Barnard Mfg. Co. paid its regular quarterly dividend rate of 2% and it is somewhat surprising that the stock showed a drop of $40 from the high point of $140 reached last year. Mr. Newton has made a remarkably good showing since taking over the management of the corporation and he has been conserving his resources by curtailing rather than pile up goods at a cost that might not show a profit.

The Troy has been operated upon a three-days per week schedule since Mr. Newton assumed the managment and it has paid no dividends since the first quarter when 2% was paid. No sales of the stock have been quoted but it is doubtful if any can be obtained under $500 which is the par value.

The Merchants and Granite continued their rates as of the previous year, the former paying 8% and the latter 6%. Some doubt is entertained as to the Granite having earned its dividend but the Merchants probably made a fairly good showing and some surprise is expressed that some of the latter's surplus was not distributed. The Merchants was quoted as high as 190 in the early part of the year but later it dropped down around 150. Granite has been obtainable as low as par yet sales were reported at 115½.

Charlton stock has shown little fluctuation, the lowest sales having been around 123 and the highest 135. The Charlton paid 2% quarterly despite the fact that the capital stock was doubled in the first quarter. Great confidence is expressed in Mr. Sinclair's ability as a manufacturer as shown from the fact that he was asked to also take on the management of the Osborn mill at the resignation of Treasurer James T. Milne. The Osborn paid 6%, the same rate as for the previous year but the stock has weakened materially and can be obtained slightly under par. It reached the high point of 115 during the previous year.

Pilgrim mills stock strengthened somewhat during the year as the result of increasing the dividend rate during the last two quarters on earnings. The annual statement of the corporation showed a sizable increase in quick assets during the year and Mr. Homer has well earned the confidence of his stockholders in his short management of the mill.

The Richard Borden Mfg. Co. paid 8% in dividends for the year but was forced to draw upon its surplus account to do so which has occasioned a drop of some 40 points in the quoted price of the stock though why the drop should have been so large is somewhat surprising in view of the large surplus still left.

Cornell, which has been a big dividend payer in years past, paid 9% for the year though 5% of that was paid on increased capital.

Varying Mill Conditions

It has been another lean year for the Arkwright stockholders but a change in management may improve things. The net debt of the corporation is not sufficiently large to occasion any alarm and more confidence has been shown in the stock of late which has been quoted as low as 42. The showing of the American Linen was a credit to Mr. Anthony who is one of the younger treasurers. The corporation paid 4½% but showed an increase in quick assets of nearly

Fall River Dividends in 1923

Names of Corp'tns	Capital	Rate	Amount
American Linen Co.	$800,000	4½	$36,000
Ancona Co., pfd.	100,000	6	6,000
Ancona Co., com.	200,000	..	.....
Arkwright Mills	1,000,000	..	.....
Barnard Mfg. Co.	1,250,000	8	100,000
Bourne Mills	1,000,000	12	120,000
Border City Mfg. Co.	1,800,000	6	108,000
Chace Mills	1,200,000	6	72,000
Charlton Mills	1,200,000	8	88,000
Cornell Mills	600,000	6	46,000
Conanicut Mills	200,000	..	.....
Davol Mills	500,000	16	80,000
Davis Mills	2,500,000	8	200,000
Flint Mills	1,740,000	10	150,800
Granite Mills	1,250,000	6	75,000
King Philip Mills	2,250,000	31	697,500
Laurel Lake Mills, pfd.	300,000	4	12,000
Laurel Lake Mills, com.	600,000	..	.....
Lincoln Mfg. Co.	2,250,000	8	180,000
Luther Mfg. Co.	525,000	18	94,500
Merchants Mfg. Co.	1,500,000	8	120,000
Mechanics Mills	750,000	8	60,000
Narraganset Mills	600,000	6	36,000
Osborn Mills	750,000	6	45,000
Parker Mills, pfd.	1,250,000	..	.....
Parker Mills, com.	1,500,000	..	.....
Pilgrim Mills, pfd.	350,000	8	28,000
Pilgrim Mills, com.	700,000	8	56,000
Pocasset Mfg. Co.	1,200,000	6	72,000
Richard Borden Mfg. Co.	1,000,000	8	80,000
Sagamore Mfg. Co.	3,000,000	14	420,000
Seaconnet Mills	1,200,000	..	.....
Shawmut Mfg. Co., pfd.	250,000	7	17,500
Shawmut Mfg. Co., com.	350,000	6	21,000
Shove Mills	1,200,000	6	72,000
Stafford Mills	1,000,000	6	60,000
Stvens Mfg. Co.	1,200,000	9	108,000
Tecumseh Mills	750,000	6	45,000
Troy C. & W. Mfg.	300,000	2	6,000
Union Cotton Mfg. Co.	1,800,000	6	108,000
Wampanoag Mills	1,000,000	8	80,000
Weetamoe Mills	500,000	6	30,000
Total	$42,515,000		$3,570,300
An average of 8.12½ on the above capital.			

$25,000 besides having expended as much more in improvements. The stock has dropped somewhat with practically all others of late but is still holding around 70.

The Chace mill still has a comfortable surplus and is capitalized at a low basis but the stock has been gradually dropping during the past two years from the high point of 300, attained during the war, to several points below par. Like other plain good mills the Chace has had a far from satisfactory year but it is in a position to take advantage of any improvement in conditions.

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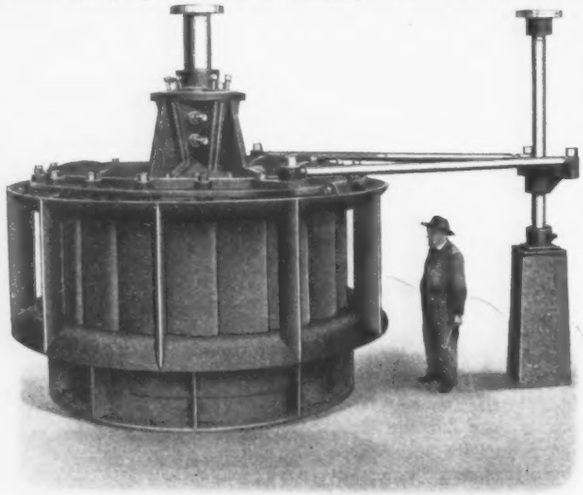

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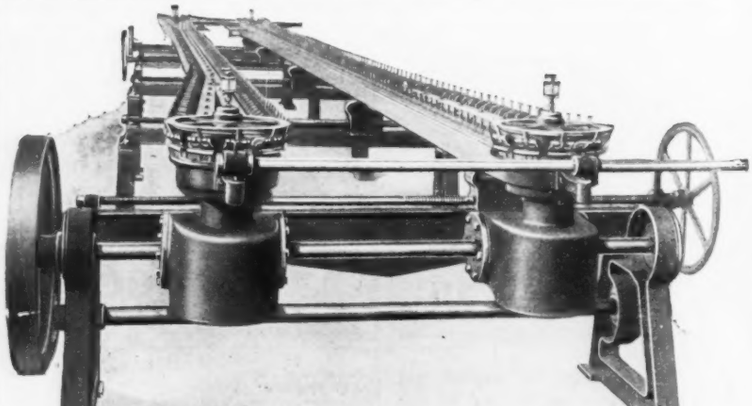

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